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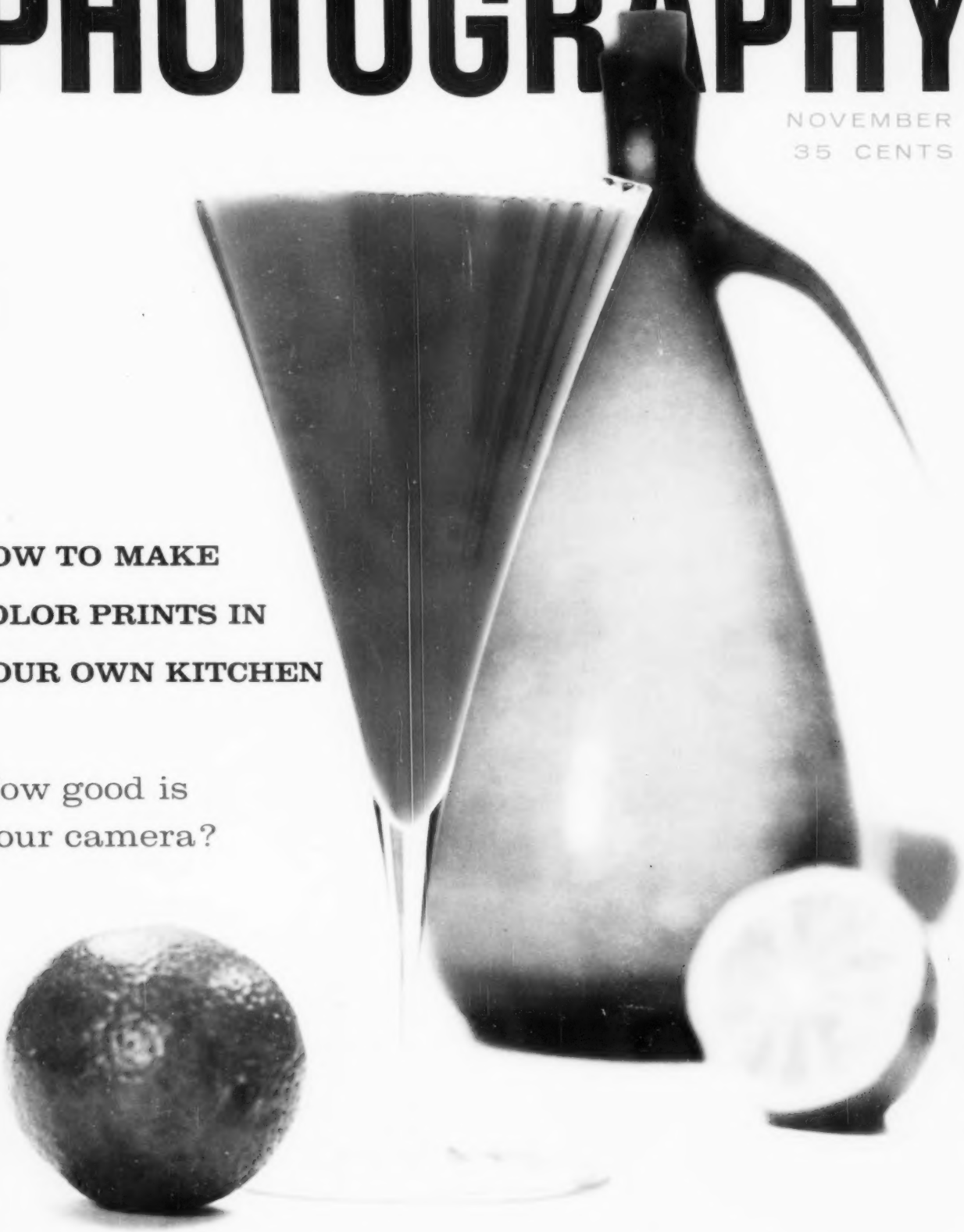

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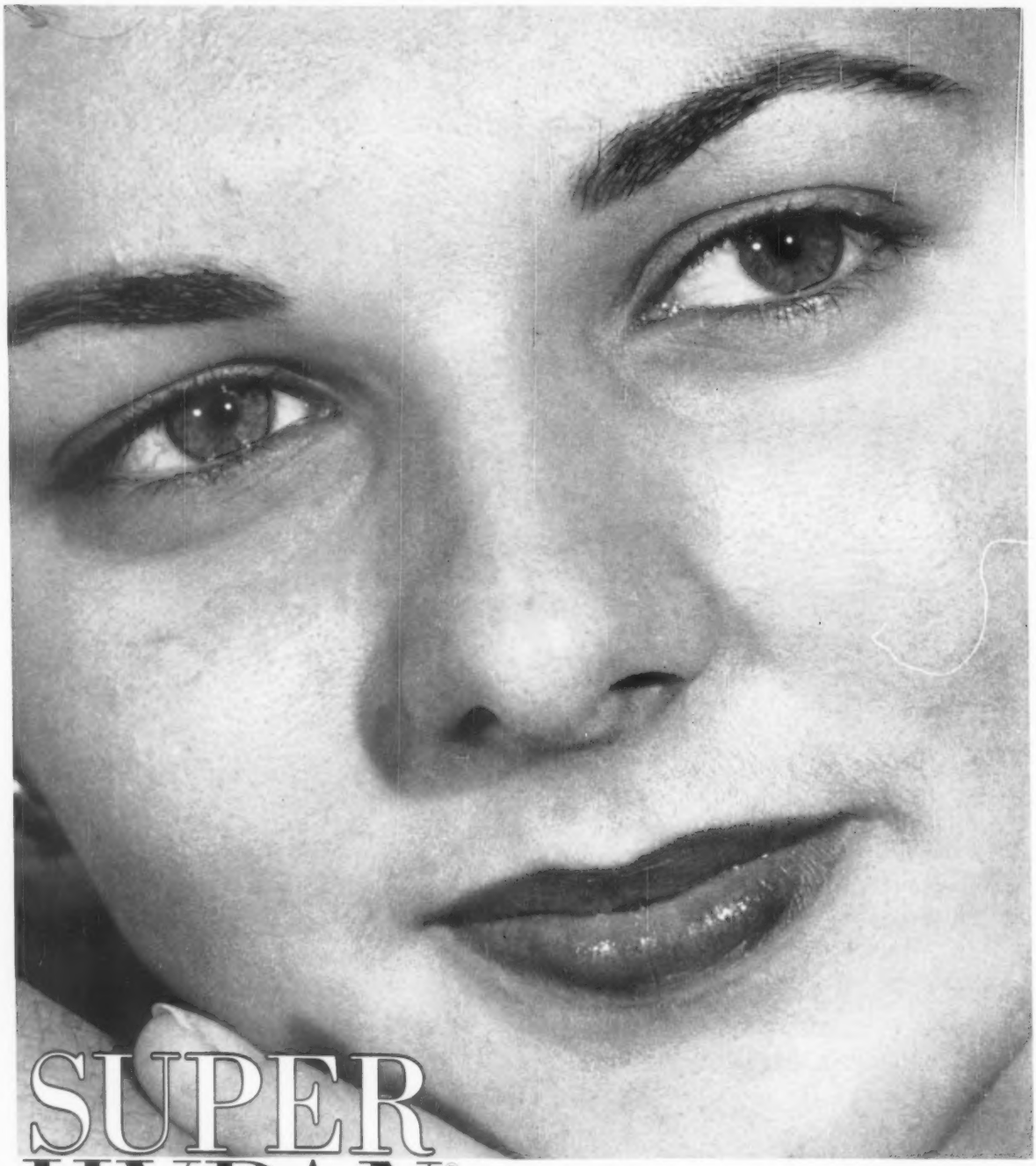
Toni Ficalora



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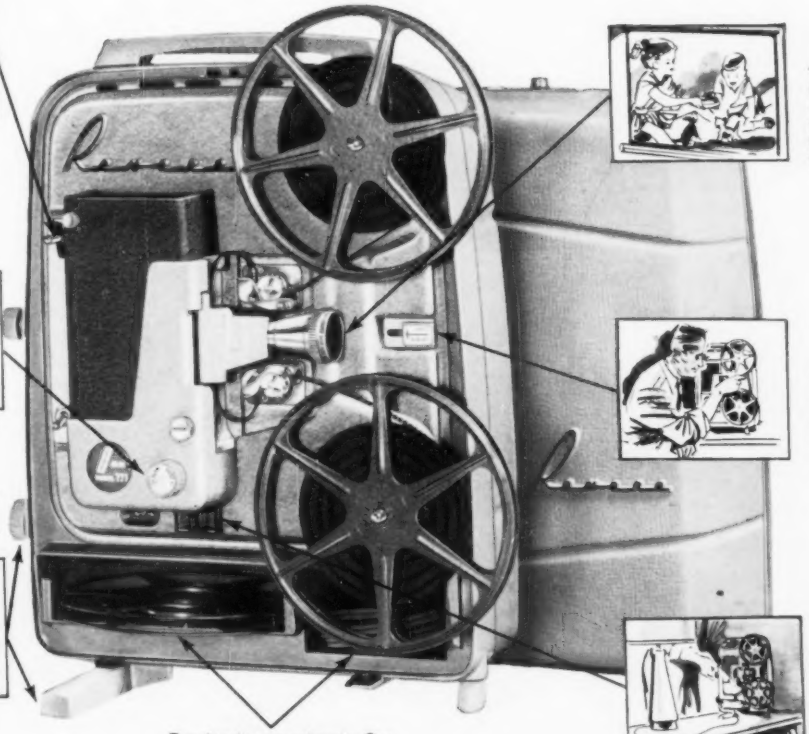

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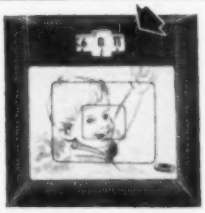

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NOVEMBER, 1958 VOLUME 43, NO. 5

WORLD'S LEADING PHOTOGRAPHIC MAGAZINE

Glass of tomato juice, limes, and pitcher combine harmoniously in this still life by New York City photographer Toni Ficalora, one of many shot for Kodak to test Type L Kodacolor during experimental stage. Reproduction was from a Type C print. (See this issue's article, *How to Make Your First Color Print.*) Ficalora's camera was a Deardorff 8x10 with 14-in. Ektar *f*/6.3 lens set at *f*/16 for this shot. His exposure was 4 seconds. Lighting was by several incandescent bulbs in studio.

GENERAL INTEREST

42 Man with a Camera
56 World's Largest Photo Market *by Simpson Kalisher*
60 Copy Your Color Slides *by Otto Bayer*
62 How to Switch Film in Mid-Roll
66 My Wife Built Me a Darkroom *by E. Peter Schroeder*

PICTURES

68 An 8-page portfolio

SPECIAL COLOR FEATURE:

76 How to Make Your First Color Print *by Gene Gaines*
114 Color Printing—*a technical supplement*

EQUIPMENT AND MATERIALS

WHAT'S NEW—Field-Test Reports and Product Listings

18 Polaroid Sheet Film
26 Leica M-2 Offers Built-In Wide-Angle Viewfinding
36 Asahi Pentax Model K
38 Product Listings
51 Rate Your Camera
52 High-Speed-Film Roundup *by Bob Schwalberg*

MOVIES

102 Our Church Movie is a Hit *by Rev. Don Bundy*
103 Creating with Film *by Charles Reynolds*
104 Kodak Brownie Goes Automatic
106 Eumig C 16 R

DEPARTMENTS

8 Letters to the Editor
14 Color Clinic *by David B. Eisendrath, Jr.*
48 The Rangefinder—News and comment by the editors
86 Amateur's Workshop—Let's Talk About Your Pictures
95 Challenge!—Announcement of new assignment
101 New Books
101 POPULAR PHOTOGRAPHY'S Traveling Exhibits
142 That's a Good Question!

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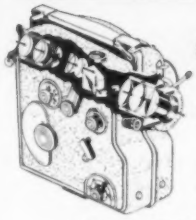

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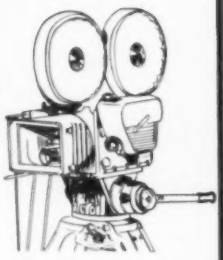

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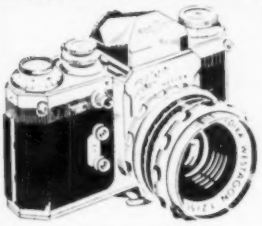

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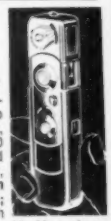

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Your trade-in may be used as down payment! It will be returned at D.F.A.'s expense if you don't accept our top offer.

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LETTERS TO THE EDITOR

Sloppy photographers

Cheers for your editorial, "Is 35-mm producing a generation of sloppy photographers?" (August). The answer is an emphatic "yes." The 35-mm camera requires the utmost skill to be used successfully, yet its deceptive simplicity encourages careless shooting. It takes a sure eye and steady hand as well as mastery of photography to produce quality prints with the miniature camera.

ROBERT JORGEN
Seattle, Wash.

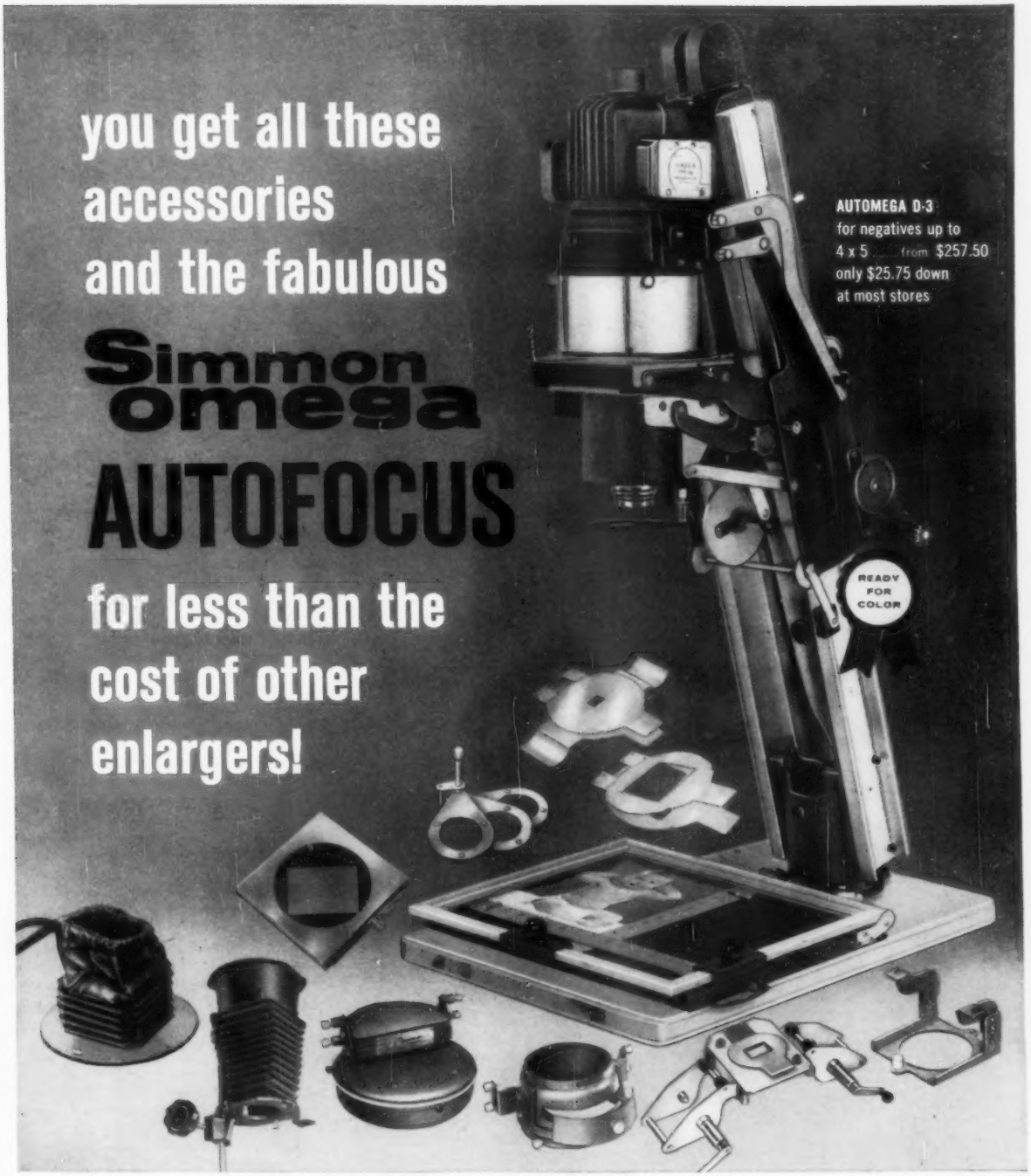
OK Mr. Downes, you've asked the question! One might even say that you've asked for "it." So—, I'm amazed that you, of all people, should be the one to lash out at "sloppy photographers." But now that you have, why don't you leaf back through your publications the past few years to see what has been held up for emulation? The cure for sloppy photography is to publish good photography —although it may be a bit hard to find, particularly among those who have geared techniques to "what will sell," and "what the editor wants." It would be a revolution!

GILBERT HILL
Oklahoma City, Okla.

If 35-mm is producing "a generation of sloppy photographers," the responsibility lies at the door of picture editors who fill the pages of even such magazines as POPULAR PHOTOGRAPHY with pictures that are grainy, fuzzy, overexposed, underexposed, distorted, tilted, and otherwise generally indicative that sloppy photography is the thing that sells.

CLARENCE W. METCALF
Sharon, Mass.

I do not believe it is the 35-mm camera that is making sloppy photographers of us. More than anything else it has been and is the continual implication that underlies almost everything amateurs read in photographic magazines to the effect that virtually all photographs should be made and judged according to magazine standards. For ten or more years now, sloppily made photographs of little men biting big dogs have been featured in



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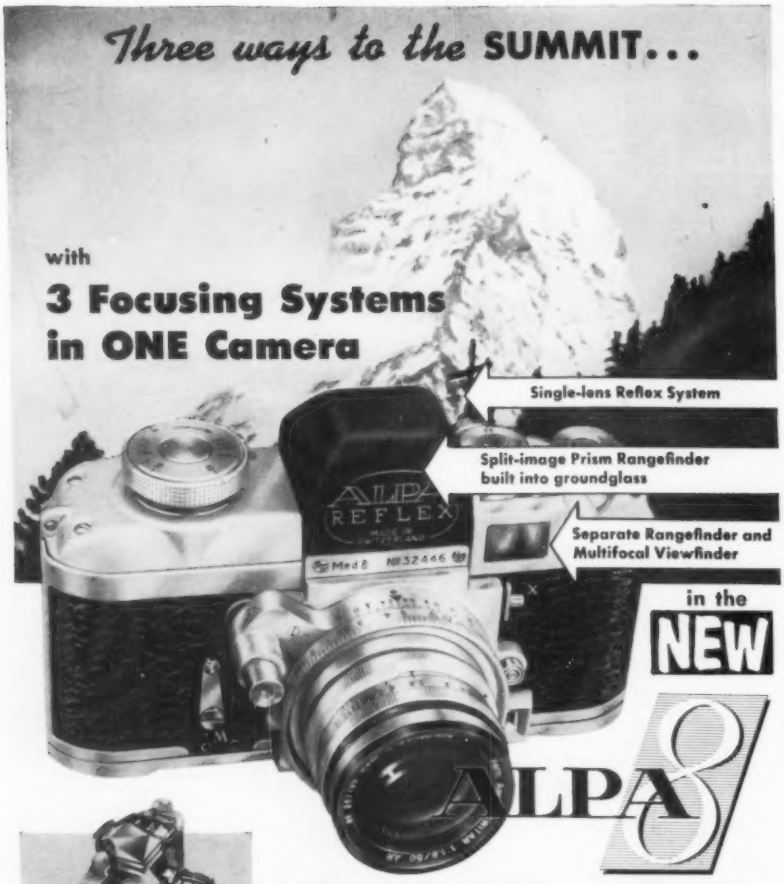

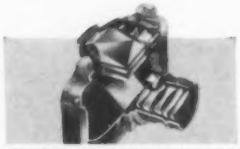

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most photographic magazines whereas superbly made photographs of the non-magazine type have been scorned.

P. W. CALHOUN
Gainesville, Fla.

Amen, and amen again, to Bruce Downes' piece on 35-mm and sloppy photography. It is to be hoped that 35-mmer's will take the man's word to heart and profit by it!

JIM FORSYTH
Orlando, Fla.

As long as poor quality pictures are bought and reproduced in such magazines as yours the technical quality will not improve. Raise your standards—accept only the best—and you will see the generation of sloppy photographers disappear. Stress the importance to the beginner of learning good photo-technique and habits with the larger cameras. When that is mastered, then go to 35-mm.

EDWARD M. GREENWOOD
Toms River, N. J.

I may be wrong in my opinion of the cause of the decline in the quality of the photographic work, but it seems to me people in general are not as conservative as in the past. All statistics and common judgment tell us that more dollars are being spent for luxuries and entertainment, than ever before. Therefore, many people using cameras are not serious about their work, even as amateurs. It is just a passing fancy to them.

MRS. T. M. PURSELLEY
Granbury, Tex.

• *The "Sloppy Photographers" editorial stepped on some sensitive toes. Most of the letter-writers accuse us of being responsible for establishing a world-wide trend. We are flattered to think that we have such power. But it just isn't so. We simply sounded a timely warning against careless use of 35-mm cameras. We will continue to publish pictures that have vitality and heart, pictures that capture the stuff of life, that is photography today. We do not intend to turn the clock back as some of the letter-writers would have us do.*—B.D.

Non-vanished darkroom

In a recent issue you had an editorial entitled "Vanishing Darkrooms." This particular discussion interested me as I am one of those still hiding out in his darkroom. Although I use strictly amateur equipment and a makeshift temporary setup, I have a lot of fun doing contact-printing and enlarging of black-and-white negatives as well as color work. (My temporary control system includes an ice cube bag and a hot water bottle.) For me, photography would lose its meaning if it were merely a matter of snapping pictures and letting Eastman Kodak do the rest. I, for one, would welcome some interesting material on both color and black-and-white darkroom techniques.

STANLEY D. GREENBLATT
Baltimore, Md.

• *For a start, see page 76 of this issue.* —ED.

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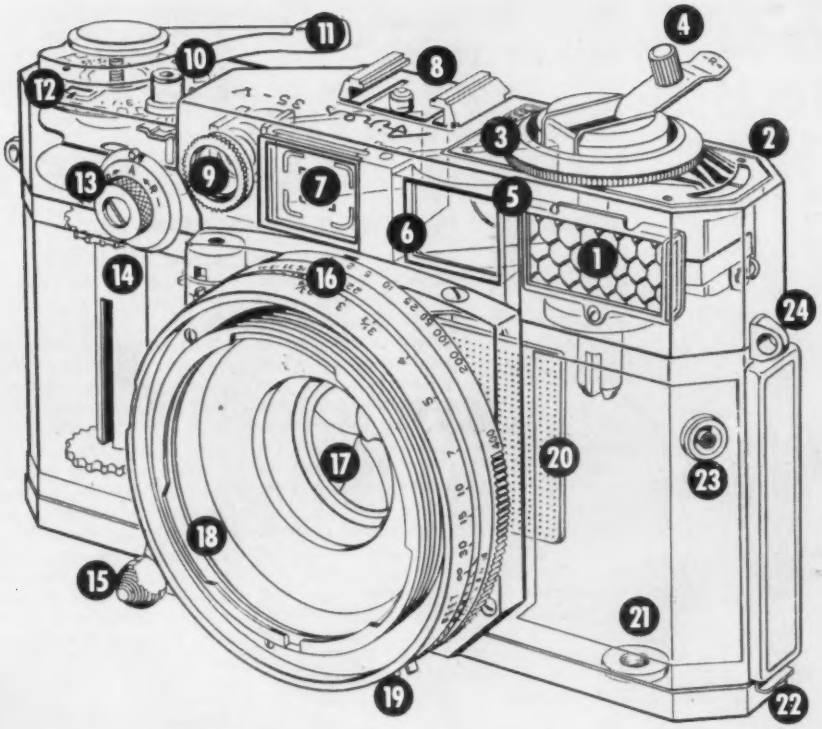

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Which slides are best for copying?

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DUPLICATING COLOR TRANSPARENCIES

By DAVID B. EISENDRATH, JR.

The problem of duplicating color slides, which our first question deals with, is one that has evidently bothered many of our readers both now and in the past. Many amateurs in particular who seem to shoot only color transparency film are bothered by their inability to show or give their work to other people other than by letting them look at the original slide.

Tremendous strides have been made in recent years in getting down the cost of good color prints, particularly with the introduction of color negative film. But for those who want slides duplicated the problem is somewhat different, as the questioner indicates, and it becomes not only a question of cost but of what slides duplicate best.

We had some slides duplicated and several sets made. Some of the slides were duplicated beautifully, others were not very successful. What is the best kind of slide for duplication?—P. U. B., Duluth, Minn.

I must apologize for an iffy answer, but it would depend a good deal on just what the subject matter is, what kind of duplicates are being made, and under what conditions the originals are shot. Almost any good original transparency can be duplicated by masking, and sometimes we use two or more masks to control both color and contrast, but this is very expensive. It is fine for professional production where price is not too important, but not for mass production or where inexpensive dupes are required. Ansco makes a special material for duplicates which is excellent for many subjects, and not too expensive, since it does not require masking. The trend among slide makers today is to make original pictures on color negative film (such as Kodacolor or Ektacolor) and make mass-produced prints and slides from this. There is enough control available here to give excellent results at low cost.

However, if you have transparencies already shot of which you want inexpensive duplicates, a transparency slightly on the heavy or dense side will often reproduce better because it has less contrast and better color saturation. The natural tendency of a duplicate to pick up contrast may be held down by the heavy original so that the duplicate is often quite satisfactory or excellent. (See page 60 in this issue for an article on the different automatic-focus devices making slide duplication simple.)

More about guide numbers

A few months ago you wrote that in computing exposure guides for Super Anscochrome and electronic flash units you took the Kodachrome exposure guide number and allowed only 2½ stops more for Super Anscochrome. I find that I can get good results allowing more than that. Am I figuring wrong?—J. R. S., New Orleans, La.

Here is a good example of what happens to me when I speak in generalities. This writer's samples bear out what he said; he was figuring correctly. Here's the story: He was using a battery-operated electronic flash unit with a relatively long flash duration, so the reciprocity failure was not quite as great as with the units shooting at 1/1500 of a second. Furthermore, his subject matter was light in color, and it also was very low in contrast. As a result, he was able to hedge a little on each of these factors and get an extra stop with his set-up.

This is a perfect example of why I am always stressing how important it is to make your *own* set of guide numbers for your unit, your camera, and the way you like your transparencies.

Photographing glassware

I recently tried to make some color photographs of fancy glassware against colored backgrounds with light coming through the glass but found that judging exposure was very difficult. What do you take the exposure from, the glassware or the background? — P.I.B., Albuquerque, N. Mex.

This is a problem even for professionals, but it can be somewhat simpler if you realize that the exposure is governed by the subject and what you are trying to show. When I photograph clear glassware against a colored background and there is no frontlight on the glass, only light bouncing off the background, I expose for the background. However, if the glass has some color, tone, or density, you must allow for this if you expect the picture to show the transparent quality of the glass. For this kind of subject I take a meter reading of the background through the glass. This means that I must use a direct-reading exposure meter; if I use a Norwood incident light meter I remove the incident light sphere and insert the grid. The grid is then turned toward the glass at the background.

Sometimes the delicate variations in transmission are so critical that you can't estimate the exposure accurately, and in these cases it is wise to bracket your exposures.

Questions of general interest to the color photographer will be answered in this department. However, individual replies cannot be given for questions that are not used.—Ed.

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•

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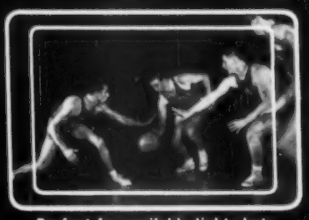

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WHAT'S NEW

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POLAROID SHEET FILM

Holder for two new 4x5 films fits existing cameras

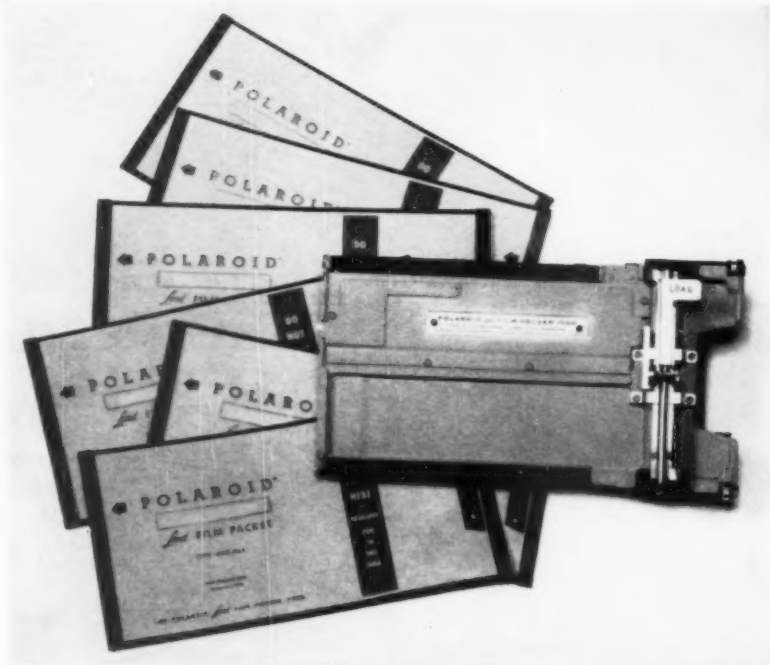
By BOB SCHWALBERG

Photographs by Werner Kuhn

A RADICALLY new Polaroid Land film holder slides into the spring back of any standard 4x5 camera and accepts individual sheets of picture-in-a-minute film. Heretofore, the only accessory for the 4x5 format was the Polaroid accessory roll holder, a large and extremely heavy device which utilized standard Land roll films to produce 8⅞ x 3¾-inch prints.

The new Polaroid sheet films are packaged in individual light-tight paper sheathes (Polaroid calls them film "Packets") which obviate the need for a conventional dark slide. These sheaths, or packets, protect the film prior to use and serve as the sheet's portable darkroom during the standard 60-second processing.

Two films, Types 52 and 53, are supplied in packet form. Both carry exposure indexes of 200 daylight, 160 tungsten, and share the same outstandingly excellent quality characteristics of the improved Type 42 print rolls. (*See* POPULAR PHOTOGRAPHY, *July 1958, for a description of this material.*) The difference between these packet films is that Type 52 has a paper negative, like the Land roll films, while Type 53 has an acetate base negative. And, yes, Virginia, if you've got a darkroom you can preserve this negative. More about this later.



Holder slides into conventional 4x5 cameras, adapting them to picture-in-a-minute photography. Type 52 (paper negative) and Type 53 (acetate base) films are supplied in individual sheaths.

Operation of the 4x5 film holder is extremely simple. The unit's thickness is the same as a late model Riteway or Fidelity holder and slips into the spring back smooth and easily. The processing unit with standard pod-busting processing rollers is at the right-hand side. The individual film packet is slipped into a generously proportioned loading lip and pushed into the holder with light pressure until a metal tab on its end clicks into a locking lip within the holder. The envelope is now withdrawn, leaving the film exposed in the picture-taking position. During the exposure this envelope hangs off to the side in a manner reminiscent of uncut film-pack papers. After exposure the envelope is slid back into the holder, and a large lever is flicked over so that the word "Process" becomes visible. This places the two stainless-steel processing rollers under spring tension, and the entire film packet is now pulled from the holder. The 60-second cycle now proceeds inside the packet. Once it's completed, the negative and print are pulled from the paper packet and separated in much the same way that any Land print is torn from a conventional (sic) Polaroid camera. Since all this occurs away from the camera, the photographer may reload and continue to make pictures.

One very excellent feature of the new film holder is the provision for removing an exposed film packet without processing. To accomplish this the photographer slides the paper envelope back into the holder, leaving the tensioning switch in its "Load" position and presses a small chrome release-catch on the back-end of the holder. This frees the packet for light-tight removal. Aside from permitting the photographer to continue shooting pictures without the one-minute delay (or having to keep track of processing times) this later-processing feature offers a number of exciting possibilities: Press photographers can shoot rapidly, process their packets while en route to the office. Photographers who want to preserve the acetate-base negative of a shot made on the Type 53 film can hold off development until they're ready for the necessary darkroom work. And, of course, the photographer who'd prefer not to go through the coating and drying procedure while on location no longer need do so.

Just before our press time the Polaroid technical department issued the following *tentative* instructions for obtaining a usable, mottle-free negative from a Type 53 film packet:

1) After the 60-second processing cycle, the print should be stripped from the negative in total darkness.

2) Immediately, the negative should be submerged in this formula at 68 F:

Preparation of D-82 with added bromide:

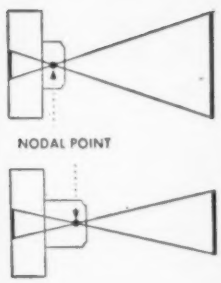
Water (130 F)	24 oz
Wood alcohol	48 cc
Metol	14 grams
Sodium sulfite (anhydrous)	52.5 grams
Hydroquinone	14 grams
Sodium hydroxide	8.8 grams
Potassium bromide	14 grams
Cold water to make	32 oz

This formula is an old-time EK max-

Couldn't be done?

New Viewfinder Principle Does It!

It took Konica to merge Single Lens Reflex Viewing Accuracy with the Handling Speed of the Rangefinder 35 mm!



As lens focuses on closer objects, its angle of view decreases, because its "Nodal Point" moves away from film. This changing angle of view is compensated for, for the first time, only by KONICA IIIA.

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Minolta's new Super "A"—with Automatically Coupled Meter and interchangeable lens—has been causing so much comment, we asked Hy Peskin, internationally famous sports photographer, to really "give it the works." Following are a few of his pictures and comments covering a Babe Ruth League game.

Hy Peskin

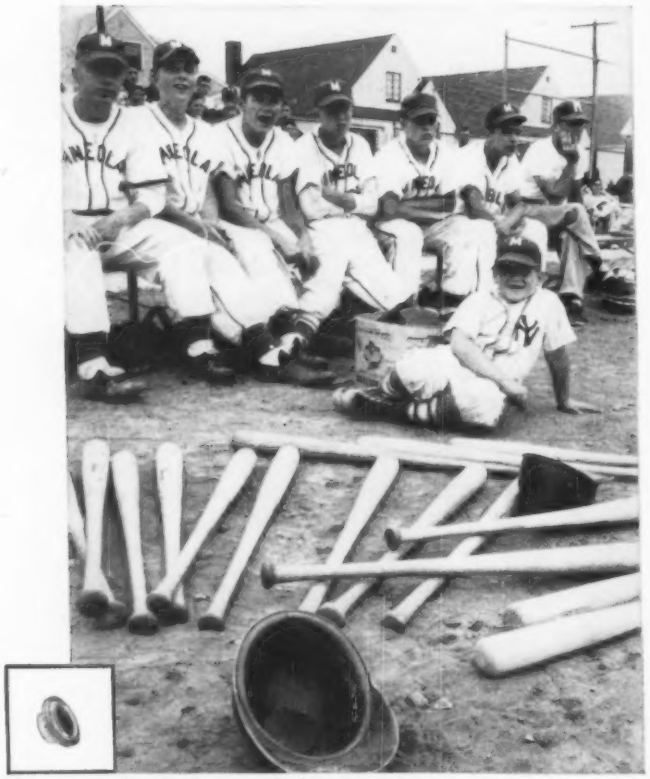
TESTS THE MINOLTA SUPER "A"

with automatically coupled meter

Rundown! Rokkor 50 mm, f:1.8 lens. 1/400 at f:5.6. Tri-X film. This lens gives coverage, plus image size, where play could go either way. Special coating eliminates UV filter. One of the finest I've used.

Strike 3! Rokkor 85 mm, f:2.8 lens. 1/100 at f:16. To bring batter up close, yet retain action at the plate, this 85 mm lens is ideal. And with f:2.8 speed, you can shoot in fading light.

Rounding First! Rokkor 135 mm, f:4.5 lens. 1/400 at f:8. This wonderful telephoto lens brought any spot in the field up close. Like being on the spot as it happened.



Foreground to background sharpness! Rokkor 35 mm, f:3.5 lens. 1/50 at f:22. Tri-X film. The corner to corner sharpness speaks for itself. Note the absence of distortion up close. Almost impossible with any but a Wide Angle lens. And the extreme depth of field lets you forget about focus.

"The Automatically Coupled Meters could change my thinking. I usually don't like the bother of a meter. But I have to admit, the automatic coupling makes it fast—and I didn't lose a single shot—despite constant changes from sun to clouds.

"The camera itself handled easy and fast—sequence shots were no problem. And I would rate the lenses with any that are made. As a matter of fact, I got some of the best sequences I've ever taken. The bayonette mount worked smoothly.

"The only real question I have, is how can Minolta possibly do it for $129.50, with an f:2 lens?"

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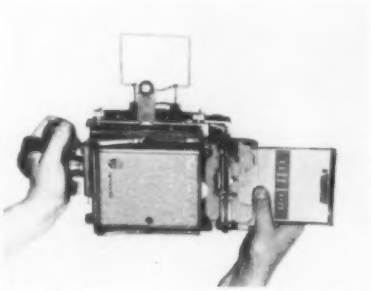
imum energy developer with a working life of not more than about two or three days, and the Polaroid folk advise using fresh solution. In mixing, be a bit careful when it comes to adding the hydroxide—pour these crystals in slowly with a steady stirring action, and keep your face away from the graduate. (A few years ago we had a batch of 82 go up in our face.)

As soon as the Polaroid Type 53 negative is under the surface of the developer (at 68 F, remember!) it is important that any of the Polaroid developing gunk remaining on the negative be immediately wiped off with gentle finger-rubbing. The developing time recommended is $3\frac{1}{2}$ minutes. After this the Type 53 negative can be stop-bathed, hypoed, and washed in the normal way.

According to the tentative data sheet, this procedure will produce ". . . *in some instances, a contrasty negative which requires printing on No. 1 paper. It is believed this will be overcome by the time the film and holder goes on the market and Polaroid's final recommendations will be printed in the Type 53 film instructions.*"

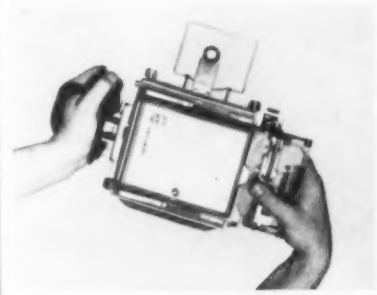
Unfortunately, we were unable to try this method prior to this writing so we can add little by way of actual experience except to say that D-76, DK-60a, and Dektol don't work. These we tried. Look for more information in an upcoming issue, after we've tested the method.

The holder at work

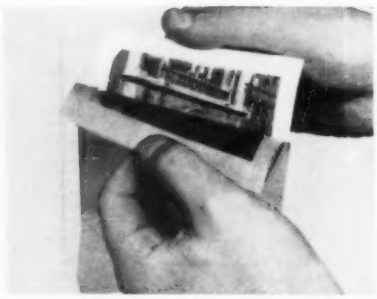


Holder fits onto back of any standard 4×5 camera. Individual packet of film is inserted into holder over rubber roller, taking care not to squeeze pod containing developer chemicals. Metal tab inside holder locks film in position.

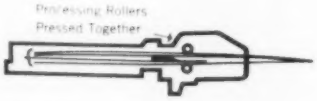
Pulling light-tight envelope of packet uncovers film inside holder, allows exposure to be made. Holder's pressure plate keeps film flat. Diagram below shows cutaway view of holder, position of negative, pod, rollers, and envelope.



After exposure is made, envelope is pushed back into holder, where it is caught by metal tab to once again make a light-tight packet ready for removal. Lever is flipped from "load" to "process" position, closing rollers.



Film packet is pulled briskly from packet; closed rollers break pod and spread developer. After 60-second processing cycle, film packet is pulled apart and print is separated from negative. Print should be coated immediately.



WHAT'S NEW continued on page 26

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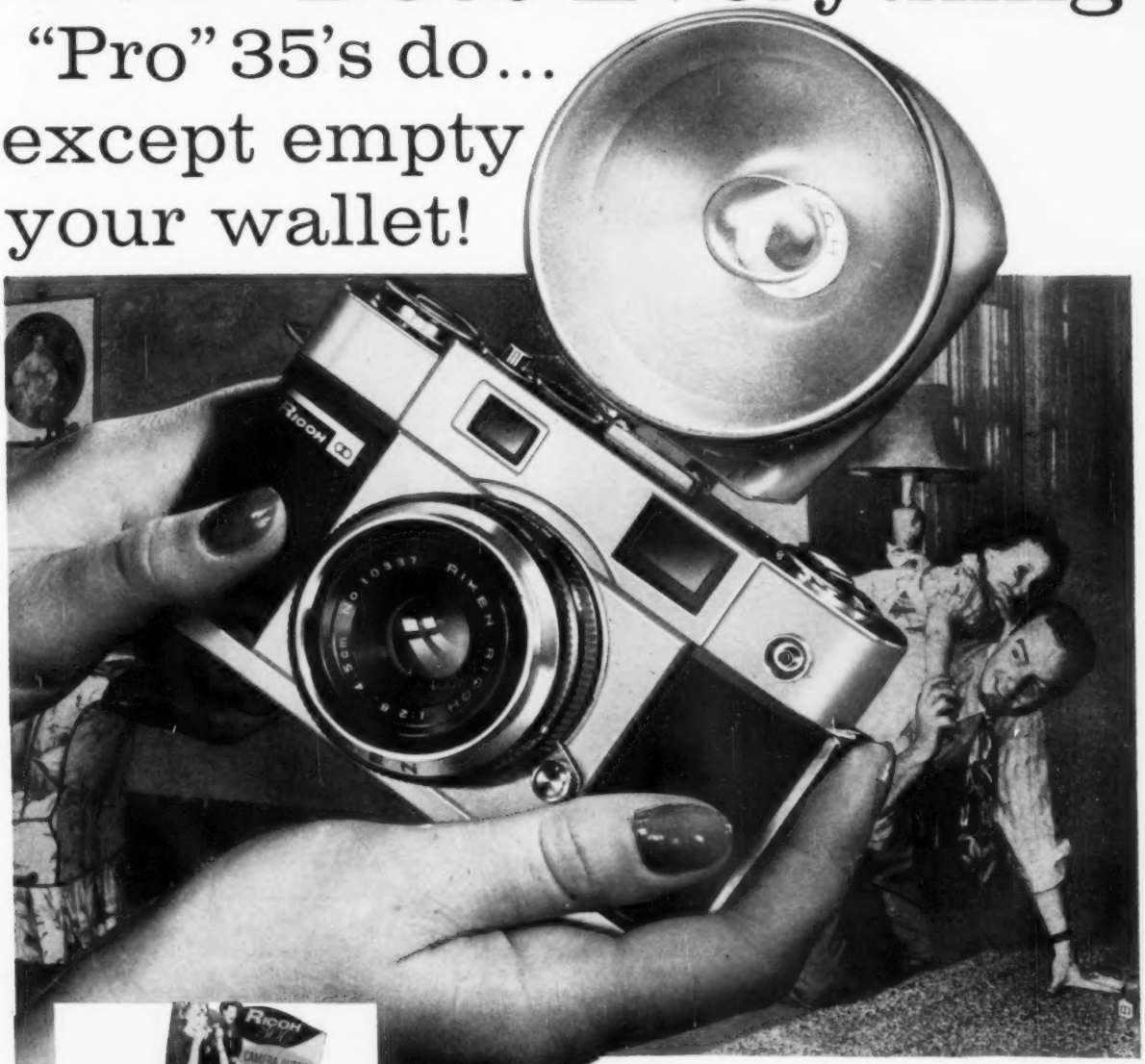

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LEICA M-2 OFFERS BUILT-IN WIDE-ANGLE VIEWFINDING

A compatible companion to the M-3, it automatically gives fields for 35-mm, 50-mm, and 90-mm lenses

By BOB SCHWALBERG

With its American debut timed to coincide with the opening of *photokina* 1958 in Cologne, Germany, on September 27, the new Leica M-2 takes its place as a wholly compatible companion camera to the famous Leica M-3. The M-2 follows the basic design pattern originally laid down in the M-3 (*which was unveiled at* photokina *1954*) with some very significant borrowings from the Leica MP, which was introduced in 1956 and fewer than 500 of which were ever made. Chief features of the M-2 are:

New Universal Viewfinder: The built-in universal viewfinder of the Leica M-2 provides parallax-corrected illuminated bright-line field frames for the 35-mm wide-angle, 50-mm normal-focus, and 90-mm medium-tele lenses. As in the M-3 (whose finder provides field frames for the 50-, 90-, and 135-mm focal lengths), these frame lines appear automatically, one at a time, as the appropriate lenses are inserted into the camera's bayonet lens mount. The M-2's coupled rangefinder is combined with the viewfinder through a single eyepiece, and this is the first time that this combination of built-in features has ever been provided for the 35-mm focal length in an interchangeable-lens camera. (*Previous cameras have incorporated 35-mm finders which were separated from the coupled rangefinder system and which did not offer automatic parallax correction.*)

Because of the wide (63-degree) field encompassed by the 35-mm focal length, the viewfinder magnification of the M-2 has been set at 0.75, which means that subjects seen through it appear ¾ life size. The magnification of the M-3 viewfinder is 0.9, or 90-percent life size. This lower M-2 magnification makes it possible for the eye to take in the entire 35-mm lens field without scanning, but results in a slight reduction of viewfinder frame size with the 50- and 90-mm focal lengths. In practice we found this slight loss of magnification to be noticeable when comparing the 50-mm frames of the M-2 and M-3, but almost completely negligible in the case of the two cameras' 90-mm frames. One rather obvious M-2 advantage is the thicker 90-mm field frame which tends to be more highly visible than with the M-3.

New Film-Transport Mechanism: The film-transport mechanism of the M-2 has been altered to very closely resemble that of the now-discontinued MP except that the rapid-advance lever now transports the film and resets the shutter in a single stroke. This has been accomplished in such a way, however, that M-3 users who may prefer to use the two-stroke method (which causes far less camera jarring during transport, and is at least 90 percent as fast) can continue to hit the lever twice. The M-2 stroke starts from a ready-position about 40 degrees away from the body axis, exactly as does the M-3 lever) and extends through an arc of 110 degrees. Although we found the M-2 leverage extremely smooth and speedy, it does seem regrettable that this single-stroke lever was not adjusted to the ready position used in the MP. This position, about 20 degrees out from the camera back, would have meant that the M-2 would both begin and end its stroke some 20 degrees sooner and would doubtlessly add to its ease of manipulation and speed of operation.

Although no mention of a Leicavit base-plate advance mechanism was made in the press release for the M-2, we were able to ascertain that the Leicavit provided for the MP fits the M-2 perfectly. The announcement at some future date of a Leicavit base-plate trigger wind for the M-2 should therefore come as no surprise. In addition, it's worth noting that the M-2 film transport lends itself to an electric base-plate motor-drive unit which is not feasible for the Leica M-3.

New Coupled Rangefinder Convenience: A unique rangefinder innovation referred to as a "scanning depth-of-field check," has been incorporated into the M-2's coupled rangefinder system. At the time of this writing the device is still so new that no instructions for its use were available. The device consists of two tabs which appear at the top of the camera's rangefinder rectangle, a wide one on top, a very much narrower tab below. Both tabs, according to the sketchy information available, are designed for use with the normal 50-mm lens.

After focusing, the photographer checks to see if the image spread of objects in front of, or behind, his point of focus are contained within either tab. Objects whose out-of-focus spread is contained within the wider (top) tab will fall within the depth of field when the lens is stopped down to *f*/16; those falling with-

Closely resembling Leica M-3 in looks, new M-2 actually is 1¾ ounces lighter, lacks self timer and advance-rewind lever, is further distinguished by collector plate with vertical stripes in middle frame-illuminator window.

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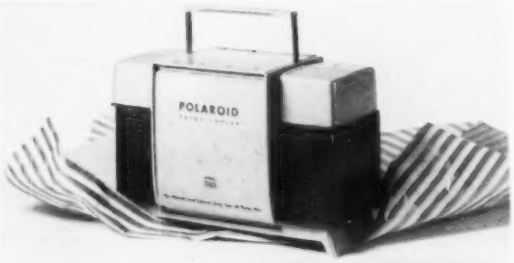
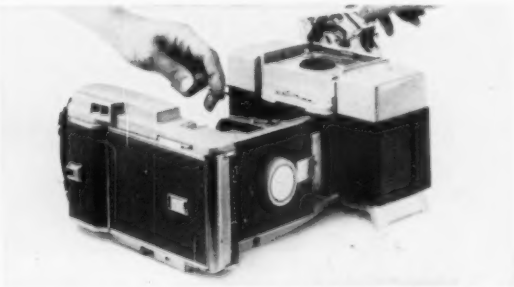
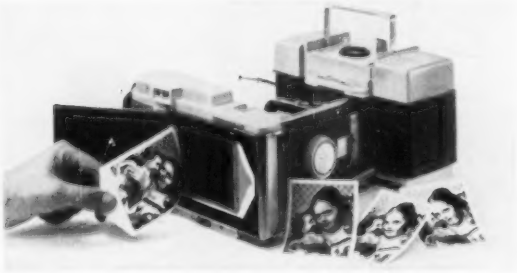


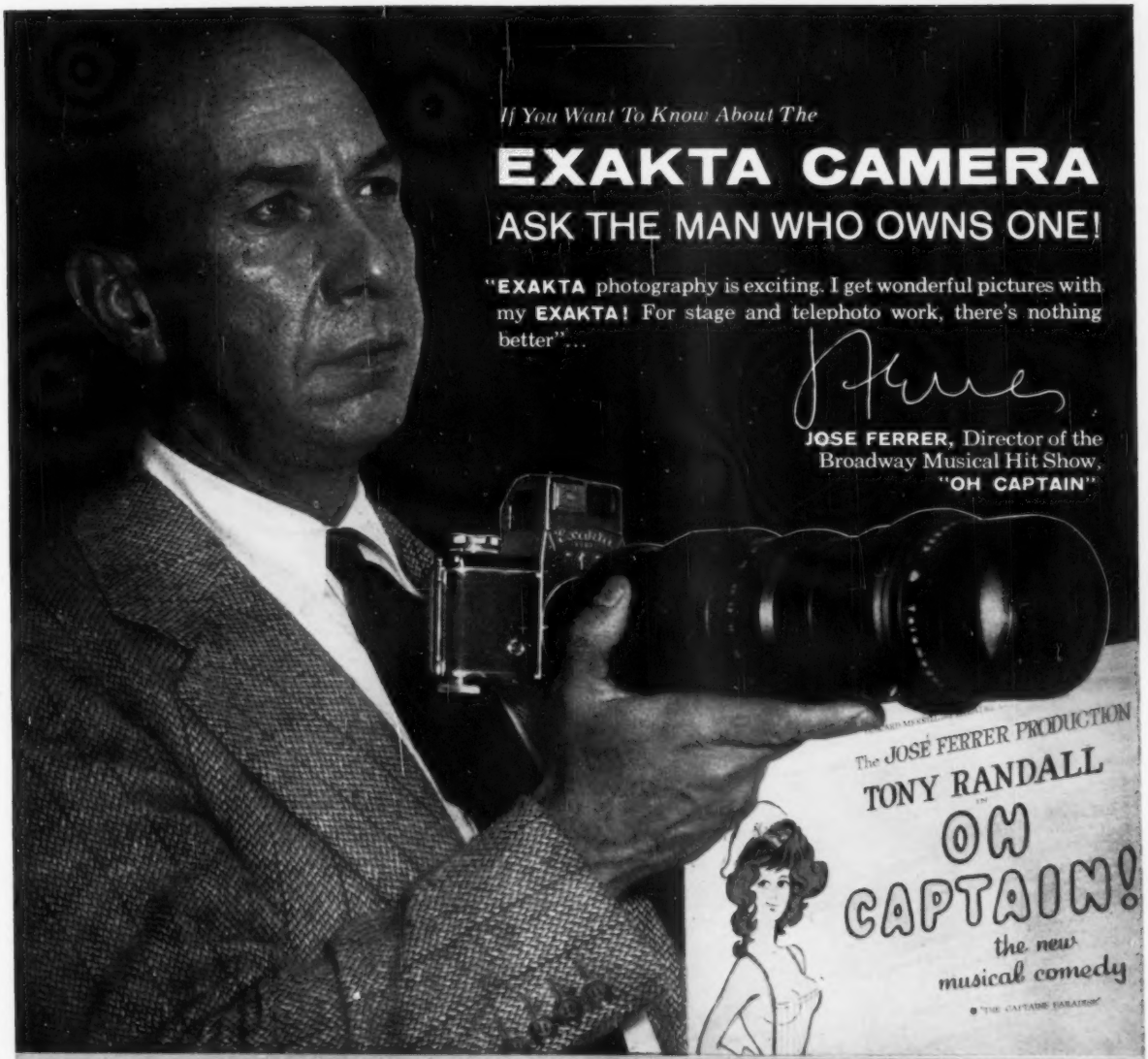
(2) With this new Polaroid Print Copier, you can now make *extra copies* in 60 seconds, right in the living room. It means you can hand out copies on the spot to the person in the picture, mail another to the folks and still keep the original for your family album.



(3) Just slide your original snapshot into place inside the Print Copier, slip your Polaroid Land Camera into position, and you're all ready to take "a picture of your picture." (The Print Copier has everything else built in: copying lens, lights, timer.)



(4) 60 seconds later, you flip open your Polaroid Land Camera and pull out a sharp duplicate print! It's that easy. The Polaroid Print Copier costs only $29.95. Polaroid Land Cameras are priced from $72.75. Imagine the excitement Christmas morning if you gave him *both!*



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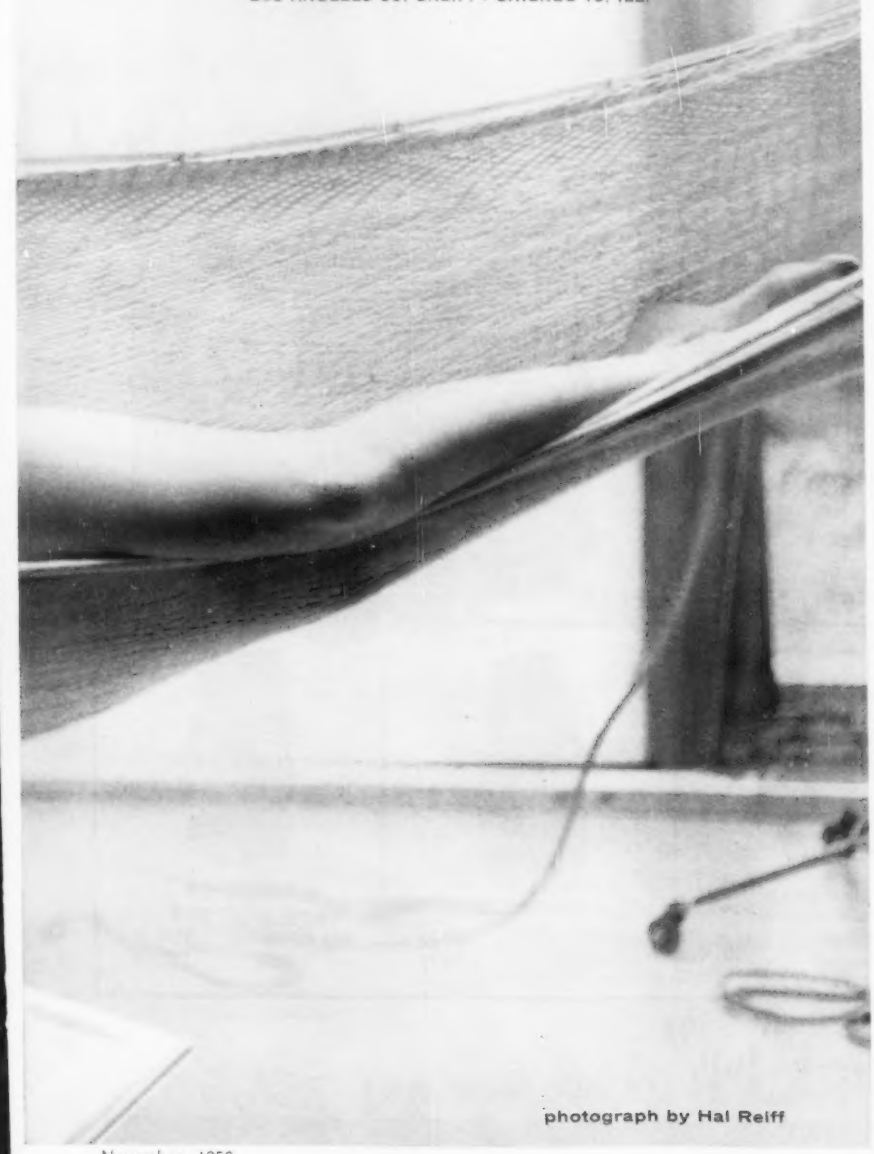

photograph by Hal Reiff

WHAT'S NEW

in the narrower (bottom) tab will appear sharp when the lens is opened to f/5.6.

The full exploitation of this rather unusual rangefinder adjunct will, very obviously, depend on future instructions from the folks in Wetzlar.

Other Features: The M-2 carries forward all of the important M-3 features including the identical bayonet-type lens mount with the same flange-to-film distance. This means that almost all bayonet-mounted Leica lenses (as well as screw-mounted lens in M-bayonet adaptor-rings) can be used on the M-2. Here are the exceptions:

1) Earlier bayonet-mounting Summaron lenses and lenses in 35-mm adaptors) can be used on the M-2, but will cause the 50-mm lens field frame to pop into position. Only Summaron lenses designated for the M-2 will give the 35-mm field of view. If M-2 designated Summaron lenses are used on the M-3 they will cause that camera's 135-mm field frame to appear. However, since the M-3 was not designed to frame the 35-mm field of view anyway, this is no problem.

2) If bayonet-mounted 135-mm lenses are used on the M-2 the 35-mm field will appear in its finder. Again, however,

FEATURES

- Built-in universal viewfinder provides automatic parallax-corrected bright-line field frames for 35-mm, 50-mm, and 90-mm lenses. Individual frames automatically appear when each lens is inserted.
- Bayonet type lens mount and flange-to-film distance identical with Leica M-3, allows almost full lens compatibility between M-2 and M-3. (See text for details.)
- Coupled rangefinder includes "scanning depth of field check:" two tabs indicating range of sharp focus at f/16 and f/5.6.
- Single-stroke rapid film-transport; may be double-stroked if desired.
- Click-stopped, non-rotating, shutter-speed selector wheel providing 11 speeds from 1 to $\frac{1}{1000}$ second and Bulb. Shutter-speed wheel couples to M and MC Leica Meters.
- Zero-delay flash synchronization for electronic flash and M-2 bulbs at $\frac{1}{50}$ second; M synchronization for all shutter speeds up to $\frac{1}{500}$ second.
- Film transport designed to accept forthcoming Leicavit and electric-motor base plate drive units.
- Flip-open camera back.
- Pre-selector switch to temporarily illuminate any of the three built-in frame lines.
- Distributor: E. Leitz, Inc., 468 Fourth Ave., New York 16, N. Y. Price: body only, $216; with 50-mm Elmar f/2.8, $276; with 50-mm Rigid Summicron f/2, $345.

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This one feature alone puts the Nikon SP years ahead of any other 35.' But, it is *not* alone, for the SP has many new features which easily make it the most complete, most advanced '35' in the fine camera field — like the new compensating flash-synch control, color-coded for bulb types and shutter speeds — the calibrated self-timer — the improved non-rotating speed dial — the automatic 'O' reset exposure counter and load indicator — and many others.

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since the M-2 was not designed to frame the 135-mm field of view this offers no problem, an accessory finder being required in either case.

All other bayonet-mounted Leica lenses (and lenses in "M" adapters) are completely compatible with the Leica M-2 as is the Leitz reflex-housing (Visoflex) attachment.

Other important carry-overs from the M-3 are: the heavily click-stopped, non-rotating shutter-speed selector wheel which provides eleven exposure intervals doubling in evenly *arithmetic* progression from 1 to 1/1,000 second, and Bulb. (*This wheel is, incidentally, equipped with the milled slot which couples the Leica Meters "M" and "MC" to the camera shutter.*) The automatic flash synchronization system with individual outlets located on the back panel of the camera to the right of the viewfinder eyepiece, providing zero-delay synchronization for electronic flash and M-2 bulbs at 1/50 second (*indicated by a red lightning bolt on the speed wheel*) and class M synchronization at all shutter speeds up to 1/500 second. The flip-open camera back which facilitates easier loading and cleaning of the film gate when required, and the focal-frame "pre-selector" switch which enables the user to temporarily switch-in any of the camera's three built-in frame lines.

Elimination of Frills: In order to make possible the M-2's lower price (the camera body or any combination of camera and lens costs considerably less than the M-3), a number of frills have been eliminated. These include the automatic self-starting frame counter of the M-3, the M-2 being equipped with a manually-set counter dial concentric with the release button, and the advance-rewind lever of the M-3, the M-2 having a simplified push button which must be continuously depressed during rewinding. The raised chrome guard rail which surrounds the bayonet-mount release catch on the M-3 has been eliminated completely on the M-2, as has the self-timer.

Two extremely minor, though highly noticeable M-2 changes are its lighter weight of about 18¾ ounces (less lens) which is about 1¾ ounces less than the M-3's 20.5 ounces, and a new collector plate in the middle frame-illuminator window with vertically ground parallel stripes. This last change was probably incorporated to enhance the appearance of the window which under conditions of high tropical humidity sometimes assumes a mottled appearance in the M-3. Aside from these superficial alterations (including the slight off-center canting of the strap eyelets, apparently in order to better accommodate the camera's single-stroke advance-lever operation) the M-2 has the identical body dimensions of the M-3 and follows its basic styling so closely that the two cameras are almost indistinguishable at first glance.

New "M-Camera" Pricing: At the same time that the M-2 was introduced, a whole new pricing setup for the M-3, reflecting savings of approximately ten percent, were put into effect. The following chart summarizes the price picture for both the M-2 and M-3 with various lens combinations:

	LEICA M-2	LEICA M-3
Body only	$216	$270
With 50-mm Elmar f/3.5 lens.....	267	321
With 50-mm Elmar f/2.8 lens.....	276	330
With 50-mm Rigid Summicron f/2 lens	345	399
With 50-mm Dual Range Summicron f/2 lens....	384	438
With 50-mm Summarit f/1.5 lens..	363	417
With 35-mm Summaron f/3.5 lens	298	*
With 35-mm "R-F" Summaron f/3.5 lens	*	396

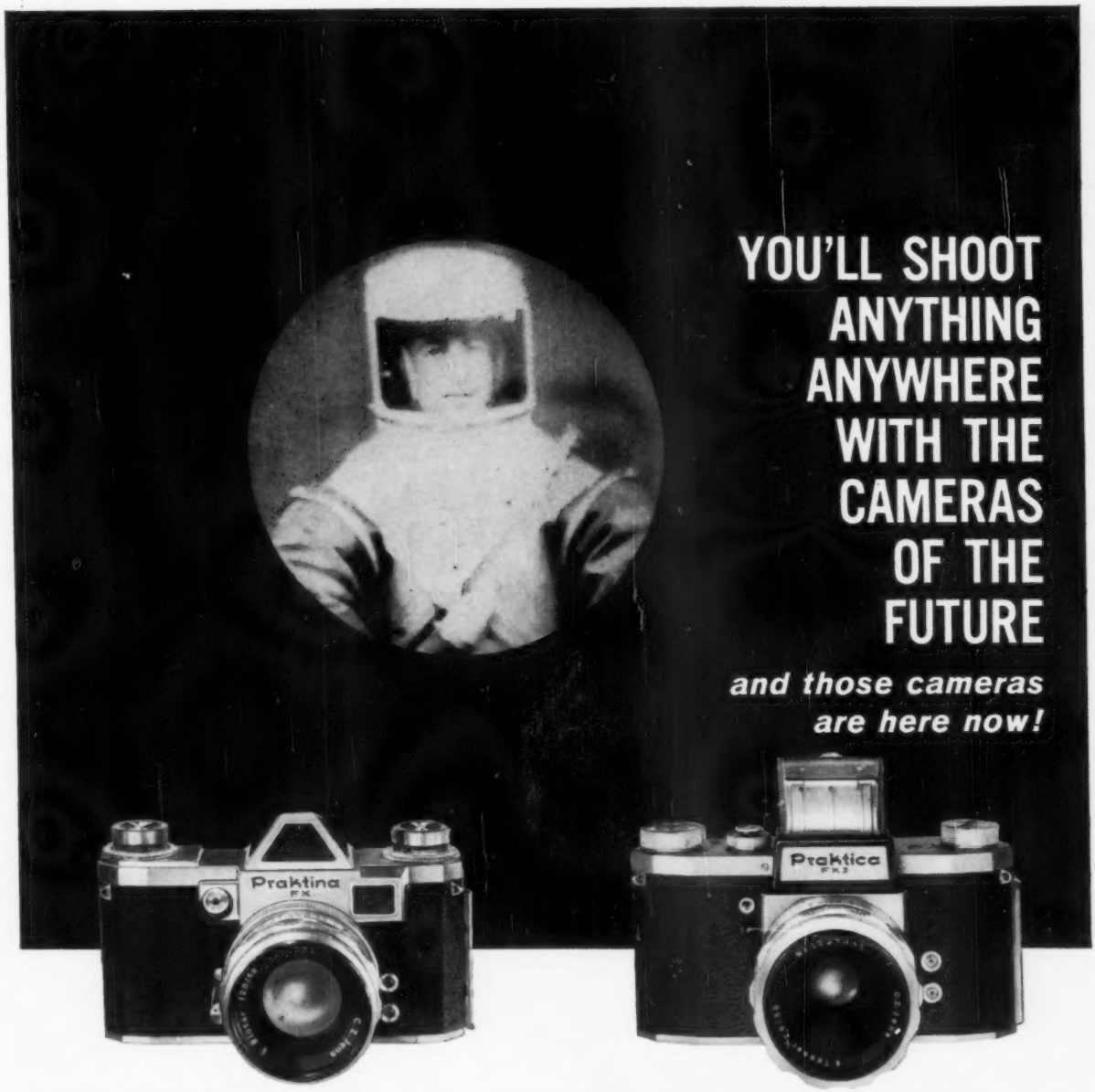
* *The RF Summaron can be used on the M-2, its standard 35-mm "M" bayonet mount bringing the M-2's 50-mm frame into the finder. This is then minified by the RF lens' optical viewing unit, exactly as with an M-3.*

M-2 vs. M-3. An Unavoidable Comparison: In providing a companion camera to the M-3, which it must be emphasized, will not be discontinued, the Leica folks have sacrificed none of their high standards—only a few nonessential extras (such as the doubtful self-timer). In so doing the Wetzlar wizards have greatly improved upon their own M-camera wide-angle-lens performance, bringing new ease of operation to the user of 35-mm lenses. Borrowing heavily from the Leica MP, they have, in the M-2, provided a camera which will be of interest to amateur and professional alike. That neither camera may be properly counted as "better" is obvious to anyone who has handled both, and the selection of an M-2 or an M-3 will rest largely upon the user's personal evaluation of a built-in 35-50-90 or 50-90-135 viewfinder system. The current popularity of the 35-mm wide-angle focal length, and the announcement of the new wide-angles that are definitely in the immediate offing, should provide the Leica M-2 with a built-in audience. As a "second camera" to the M-3, it's a natural.

NEW LEICA WIDE-ANGLE LENSES FOR 1959

Although only the 35-mm Summaron f/3.5 lens will be available before the first of the year, a number of new wide-angles are in the offing. It is expected that Leitz will shortly announce two new 35-mm lenses, one an f/2, the other with a maximum aperture of f/2.8. In addition, there will be a new 21-mm super-wide-angle f/4 lens which will couple to the rangefinders of either "M" camera. These lenses will all make their appearance after the first of the year, although exactly when is still uncertain.

WHAT'S NEW continued on page 36



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ASAHI PENTAX MODEL K

Improved version offers automatic diaphragming

A newly released revision of the Asahi Pentax—the Model K—now provides automatic internal diaphragming via the camera's body release. In operation, the photographer first preselects the lens opening which he intends to use and cocks a spring-loading sweep lever on the upper left-hand side of the new automatic lens mount. Upon squeezing the shutter release a large half-moon-shaped bumper in the lower right-hand side of the film chamber moves forward to press a small release pin on the rear of the lens mount. Upon contact, the diaphragm snaps to the preselected aperture, the mirror swings up and out of the way, the shutter then opens and closes, and as in the other Asahi models, the mirror instantly returns to focusing position without the help of the advance lever.

Other changes in the Pentax K are the addition of a 1/1,000-second top shutter speed to the range of evenly doubling speeds starting at 1 second, and a new Fresnel focusing-viewing screen. The original Pentax had a concentrically ridged Fresnel screen with a ground center spot for focusing. In the K camera this has been altered so that we have a specially ground center spot surrounded by a plain-ground doughnut. The new center spot has an odd diamond-like pattern which has been provided, according to the makers, in order to make out-of-focus objects appear somewhat distorted. This distortion disappears as soon as the camera is brought into focus and, again according to the manufacturer, the device is designed as an aid to speedy focusing. Whether this is really an improvement over the old plain-ground center spot is a matter for personal evaluation. With some types of subject matter, such as anything containing a regular geometric pattern, the new distortion spot seems to be a help. With other subjects, such as people's faces, it does not seem to be such

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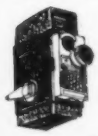

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Dejur Eldorado CC	84.00	50.00
Revere P777 CC	89.00	45.00
Revere P850 CC	82.00	45.00
Revere P90 CC	109.00	60.00
Kodak Brownie 300	47.00	20.00
Kodak Brownie 500	58.00	30.00
Kodak Showtime 500	93.00	50.00
2¼ SQUARE REFLEX		
Kalloflex	89.00	45.00
Rich Diacord C	35.00	15.00
Rich Diacord L	49.95	28.00
Kalimar Reflex	73.50	40.00
Super Rolloflex	16.00	10.00
Minolta Autocord	48.00 U	35.00
Minolta Autocord L	67.00 U	45.00
Rolleicord F3.5	29.00 U	20.00
Rolleicord V F3.5	54.00 U	40.00
Auto Rollei F3.5 Tessar	59.00 U	40.00
Auto Rollei Xenar MX	89.00 U	60.00
Auto Rollei Tessar MX	99.00 U	65.00
Rollei F3.5 Tessar LVS	119.00 U	90.00
Rollei F3.5G Meter	149.00 U	110.00
Rollei 2.8E Meter	179.00 U	140.00
EXPOSURE METERS		
GE Mascot II	7.95	4.00
Konicameter	7.95	4.00
Argus L3	12.50	5.00
Argus L44	13.50	6.00
Sekonic L21	11.00	4.00
Brockway S	22.00	11.00
GE Golden Crown	22.50	11.00
Weston III, CC	21.95	10.00
LENSES — EXAKTA PENTACON, ETC.		
35mm F2.8 Curtagon Auto	109.00	65.00
35mm F2.5 Angenieux	74.00	40.00
28mm F3.5 Angenieux	87.00	50.00
35mm F3.5 Auto Travegon	59.00	40.00
35mm Auto Flektagon F2.8	99.00	60.00
135mm F4.5 Schart	29.00	18.00
135mm F3.5 Stopomatic Tele Xenar	79.50	50.00
135mm F2.8 Auto Quinar	134.00	70.00
SLIDE PROJECTORS		
Argus 300 Standard	29.88	10.00
Kodak 300 Auto. Case	56.00	28.00
Realist 620	29.50	15.00
Realist 400 Auto	24.50	10.00
Realist 400	19.00	8.00
Revere 553 case	64.00	28.00
Revere 880D case	109.00	60.00
Kodak Cavalcade	109.00	65.00

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with a Basic Kilar!

300-mm., f/5.6 Tele-Kilar ... 197.50 | 400-mm., f/5.6 Fern-Kilar ... 249.50 | 600-mm., f/5.6 Fern-Kilar ... 599.50

ALSO AVAILABLE! 150-mm., f/3.5 Tele-Kilar (ideal for needlesharp portraits) priced at 164.50

Don't let distance from your subject stop you from shooting! Whether you are photographing the Empire State Building or a mountain from miles away, sports or other events from a grandstand, a subject across a park, a bird's nest from the ground or a parade over the heads of crowds, a Kilfitt Basic Kilar, like a telescope, will bring your subject closer to your camera without your moving a step ... and give you utmost versatility and economy in the bargain. The Basic Kilar mount is ingeniously designed so it will fit virtually all your miniature and movie cameras*, even if they are different makes, by a simple change of adapters.

A Kilar will magnify the image of a distant subject to recognizable size without sacrificing the slightest quality. The Kilfitt name on the lens is your assurance of finest resolution and manufacturing skill. The Kilars are lightweight, highly color corrected lenses unsurpassed for critical sharpness. Each long Kilar comes with a test plate photographed with that lens — indisputable proof that you are getting finest quality!

*All long focal length Basic Kilars are designed specifically for 35-mm. (24 x 36-mm.) and smaller negative sizes but may be used with 2¼ x 2¼ cameras. Adapters are available for Alpa, Contax-S, Contax-D, Exakta, Hexacon, Pentacon, Praktica, Praktiflex, Rectaflex; Canon, Contax, Leica, Nikon, and Praktina, all cameras with Leica threading; Hasselblad; Arriflex, Cine Kodak Special and all C-mount movie cameras.

Kilfitt products are made in West Germany — Kilfitt — and sold in U.S.A. by all leading dealers

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a help and we found ourselves using the plain-ground surrounding doughnut.

Excellently finished and extremely well put together, the new Pentax K contains all of the previous Pentax features from the instant-return mirror to the swing-open back with fixed take-up spool plus single-stroke film-advance lever and folding rapid-rewind crank. One fault that is continued in the Pentax K is the lack of a positive lock on the slow-speed dial at the front of the camera. Accidental turning of this dial off its 1/25 second neutral position will give a slow shutter speed regardless of the setting of the high-speed shutter dial. An excellent job despite this relatively minor (and easily remedied) fault, the Pentax K with 55-mm Auto Takumar f/1.8 lens lists for $250. Other new Pentax K Auto Takumars announced as on their way are a 35- and 100-mm lens, with still others in the offing.—

MISCELLANEOUS

LORD 4D is a 35-mm camera with a unique feature, a built-in film cutter which permits the user to cut and remove exposed film without wasting the unexposed balance of the cartridge. Other details include a rapid advance lever, a 40-mm f/2.8 lens, an MFX-synchronized shutter with speeds from 1 to 1/500 sec, LVS exposure system as well as conventional settings, bright-line single-window range-viewfinder, rapid rewind lever, and a snap-shot lock which eliminates need for focusing at distances from 6 to 15 ft under normal lighting conditions. Price, $69.95; ready case, $10.95; distributor, Allied Impex Corp., 17 W. 17th St., New York 11.

90-mm ALPA-ALTELAR f/2.8 lens for the Alpa 35-mm camera has a helical mount with a long focusing range. Extensan mount with a 20-mm extension provides normal focusing from 24 in. With extension tubes or bellows, focusing from 6 in. is possible. This preset-diaphragm lens stops down to f/22 and with its reversible lens hood, need not be removed from the camera to close the ready case. Price, $139; distributor, Karl Heitz, Inc., 480 Lexington Ave., New York 17.

PRAKTICA FX3 camera owners are offered an internally coupled lens, the 50-mm Westagon f/2, which closes the diaphragm to a pre-determined setting automatically, just before the exposure is made. It is calibrated in feet (green numbers) and meters (black numbers) and has a depth-of-field scale (white numbers on black). Price, $90; with Praktica FX3 camera, $179.50. Distributor: Standard Camera Corp., 319 Fifth Ave., New York 16.

ACCURA TWO-IN-ONE bayonet adapter ring fits both Exakta and Exa cameras, providing a 5-mm extension for close-in focusing. Imported by Photographic Imp. & Dist. Corp., 150 Broadway, N. Y. C., price is $5.95.

DECLIC is the name given a trigger-release handle grip for Bolex C-8, B-8, and B-8VS movie cameras. To revolve turret, the spring-loaded extension lever is flipped forward, returning automatically. The camera is affixed to the platform handle by means of a tripod socket. An additional socket in the handle bottom may be used for accessories. Price, incl. FET, $14. Distributor: Paillard Inc., 100 Sixth Ave., New York 13.

WHAT'S NEW continued on page 118

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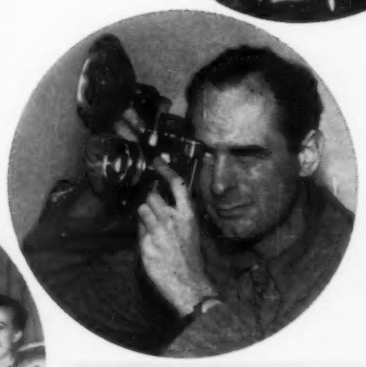

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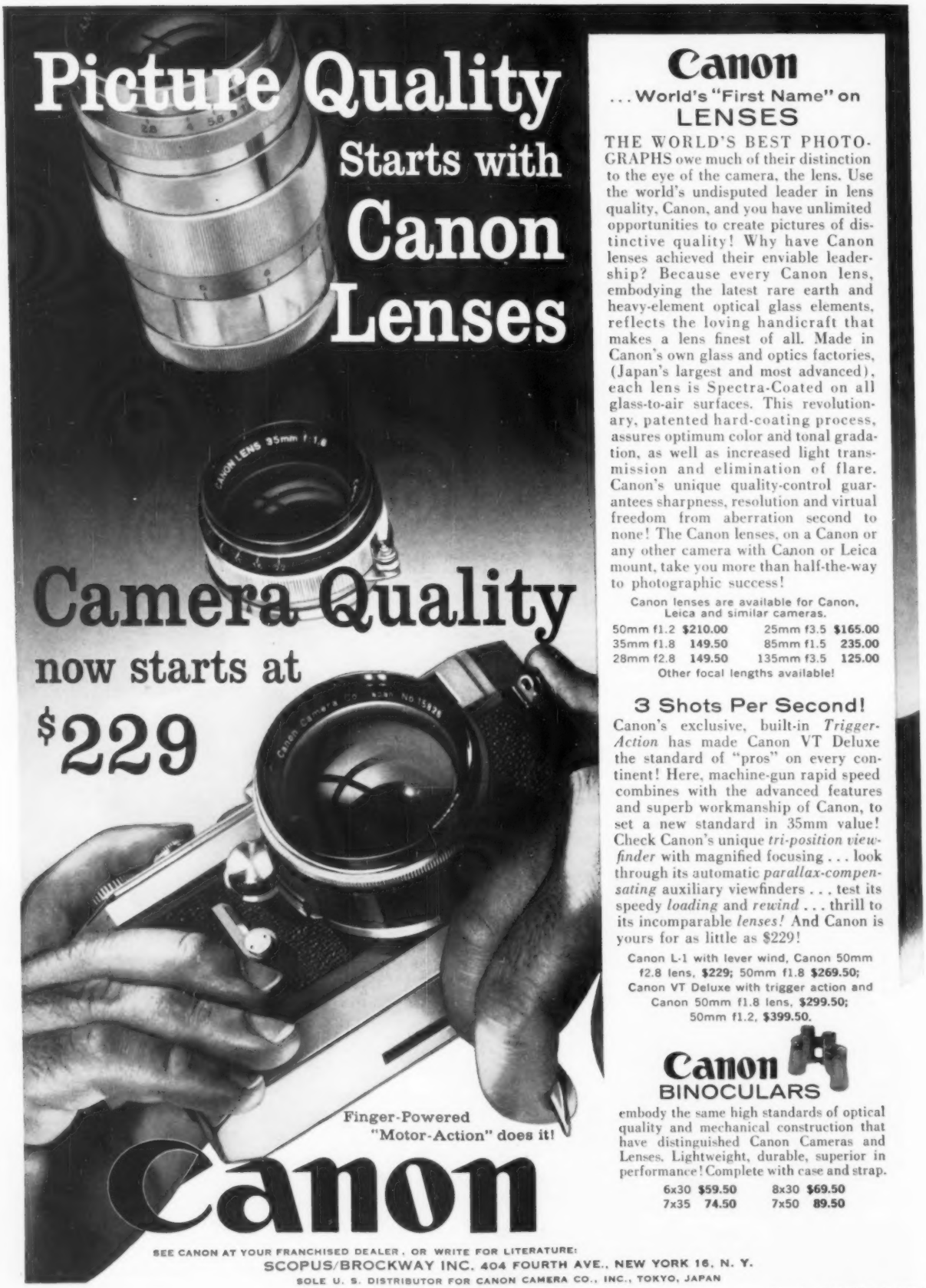

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Other focal lengths available!

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Canon L-1 with lever wind, Canon 50mm f2.8 lens, **$229**; 50mm f1.8 **$269.50**; Canon VT Deluxe with trigger action and Canon 50mm f1.8 lens, **$299.50**; 50mm f1.2, **$399.50**.

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embody the same high standards of optical quality and mechanical construction that have distinguished Canon Cameras and Lenses. Lightweight, durable, superior in performance! Complete with case and strap.

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35mm Single Lens Reflex Outfit

Our Special Price 265.

Outfit consists of Asahi Pentax with 55mm f2.2 Takumar lens, Eveready case, 35mm f2.5 Optimar, 135mm f4.5 Travenar, Alpex B.C. flashgun, Kalimar exposure meter, set extension tubes, Diamond Gadget Bag.

Total Value 440.

	NEW	USED
Asahi Pentax with 58mm Biotar f2 pre-set	149.50	—
Asahi Pentax with 50mm Westenar f2.8 pre-set	119.50	—
Asahi Pentax with 50mm f2.8 Tessar pre-set	129.50	—
Miranda with 58mm Biotar f2 pre-set	167.50	—
Miranda with 50mm Westenar f2.8 pre-set	137.50	—
Miranda with 50mm f2.8 Tessar pre-set	147.50	—

Accessories and lenses in stock. Please ask for new price list.

CONTAX II A

50mm f2 Sonnar new latest fully synchro mode

New 197.50

	NEW
Contax IIA Body	102.50
Contax IIA with 50mm f2 Sonnar	187.50
Contax IIA with 50mm f1.5 Sonnar	212.50
Contax IIA with 50mm f3.5 Tessar	156.50
Contax IIA with 50mm f1.1 Zunow	299.50
Contax IIIA Body	118.00
Contax IIIA with 50mm f2 Sonnar	212.50
Contax IIIA with 50mm f1.5 Sonnar	228.50
Contax IIIA with 50mm f3.5 Tessar	161.50
Contax IIIA with 50mm f1.1 Zunow	313.50
Eveready case	11.95

Please write for other low quotations on lenses and accessories.

PRAKTINA FX

165. Used
New 224.
58mm f2 Auto. Biotar

	NEW	USED
Praktina FX, with 55mm f1.9 automatic Quinon	224.00	—
Praktina FX, with 50mm f2.8 Automatic Tessar	164.50	120.00
40mm f3.5 Cassaron	40.95	—
35mm f2.8 Automatic Zeiss Flektagon	112.00	—
75mm f1.5 Biotar pre-set	162.00	—
80mm f2.8 Biometer pre-set	88.95	—
135mm f2.8 Quinar pre-set with case	112.00	—
135mm f3.5 Travenar auto. pre-set	89.50	—
150mm f5.5 Telemegor pre-set	41.95	—
150mm f5.5 Telemegor pre-set	62.50	—
400mm f5.5 Telemegor pre-set	149.50	—
Case	9.00	—
Extension Tubes	14.95	—
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PRAKTICA FX2

60.00 Used
New 89.50

W.L. Finder, 58mm f1.9 Primoplan Pre-Set

	NEW	USED
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Praktica FX 3 W.L. with 50mm f2 Auto. Westagon	119.50	—
Praktica FX 3 W.L. with 50mm f2.8 Auto. Westenar	99.00	—
28mm Angenieux f3.5 Pre-set	89.95	—
35mm Lithagon f2.5 Pre-set	59.50	—
35mm Optinar f3.5 Pre-set	49.95	—
135mm Travenar f3.5 Pre-set	49.95	—
135mm Tele-Xenar f3.5	39.50	—
150mm Tele-Megor f5.5 Pre-set	41.95	—

More than 500 lenses and accessories are available for Praktica Cameras.

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New 74.50
List Price 99.50
50mm f2.8 Steinheil

	NEW	USED
Automatic Edixa Reflex Model B with PP RF 50mm f2.8 Auto. Travenar	223.50	167.95
Automatic Edixa Reflex Model B with PP RF 50mm f2 Auto. Westagon	303.50	227.50
Automatic Edixa Reflex Model C with PP RF and exposure meter with 50mm f2.8 Auto. Travenar	248.50	186.50
Automatic Edixa Reflex Model C with PP RF and exposure meter with 50mm f2 auto. Westagon	298.50	223.95
Automatic Edixa Reflex Model C with PP RF and exposure meter with 50mm f1.9 Auto. Quinon	328.50	246.50
Edixa Reflex Model A with 50mm f2.8 Cassar	139.50	104.50
Edixa Reflex Model A with 50mm f2.8 Kenar	159.50	119.50
Waist-level Finder	7.50	5.75
Eveready Case	15.00	11.25
Extension Tubes	15.00	11.25
Copring Stand	29.50	22.00
35mm f3.5 Wide angle Automatic Travenon lens	99.50	74.50
135mm f3.5 Tele-Ennalyt	59.50	44.75
400mm f4.5 Tele-Ennalyt	119.50	89.95

All accessories in stock at discount prices.

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Complete with Flashgun holders, Slimpack adapter, rollfilm, case filters and sunshade.

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127mm f4.7 Optar	495.00	49.00
127mm f4.7 Kodak Ektar	485.00	48.00
135mm f3.5 Schneider Xenotar	590.00	58.00
135mm f5.6 Schneider Symmar	490.00	49.00
150mm f2.8 Schneider Xenotar	610.00	61.00
150mm f5.6 Schneider Symmar	530.00	53.00
152mm f4.5 Kodak Ektar	499.50	49.50
152mm f6.8 Goerz Golden Dagor	545.00	55.00
162mm f4.5 Optar	514.00	51.00
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Used 69.50

Outfit includes Speed Graphic 2¼ x 3¼, Kalart R.F., f4.5 Wollensak or Ektar Lens, 3 holders, 1 film pack adapter, flashgun.

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with 50mm f1.4 Nikkor

New 229.50

(no longer imported into U.S.)

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Nikon SP with 50mm f1.4 Nikkor	564.50	—
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Nikon SP with 50mm f2 Nikkor	369.00	—
Nikon S-3 with 50mm f1.4 Nikkor	355.00	—
Nikon S-2 with 50mm f2 Nikkor	299.50	—
Nikon S-1 with 50mm f2 Nikkor	—	109.50
Nikon S-1 with 50mm f1.4 Nikkor	—	—
25mm f4 Nikkor	169.50	—
28mm f3.5 Nikkor	149.50	—
35mm f1.8 Nikkor	179.50	—
85mm f2 Nikkor	175.00	89.50
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105mm f2.5 Nikkor	152.50	97.50
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80mm f2.8 Tessar

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135mm f3.5 Ektar	279.50	—
250mm f5.6 Sonnar for C	332.00	—
150mm Sonnar f4 Hasselblad C	313.00	—
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28mm f6.3 Hektor	49.50
35mm f2.8 Biogon	69.50
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35mm f3.5 Summaron	59.50
35mm f3.5 Elmar	34.50
35mm f2.8 Schneider Xenogon	49.50
35mm f4.5 Steinheil	29.50
35mm f2.5 Angenieux	59.50
85mm f1.5 Summarex chrome	199.50

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Alpha Reflex f2.7	44.50
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Bolsey C f3.2	22.50
Bolsey RF f3.2	14.95
Canon II R.F. Body	37.50
Cos 35 RF f3.5	22.50
Contax I Body	19.95
Contax II Body	34.50
Contax III Body	39.50
Edinax f2.8	14.95
Edixa C f2.8	19.95
Exakta V W.L. Body	69.50
Exakta VX W.L. Body	79.50
Icoca 35 R.F. f3.5	19.95
Varomat 36 R.F. f2.8	42.50
Kodak 35 f4.5	9.95
Kodak 35 R.F. f3.5	19.95
Leica IIIA Body	42.50
Leica IIIF R.F. f2 Summar	115.00
Lentar R.F. Body	29.95
Nikon S Body	39.50
Nikon S-2 Body	79.50
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Prominent RF f2	99.50
Retina I f3.5	17.95
Robot Star f1.9	49.50
Signet 35 f3.5	31.95
Soligor S.R. f3.5	19.95
Super Baldina R.F. f2.8	29.50
Tower 35 R.F. Body	34.50

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Argoflex f4.5	12.95
Ciroflex D f3.5 Raptar	19.95
Ciroflex J f3.5 Raptar	29.50
Yashica J f3.5 Novar	22.50
Kodak Reflex I f3.5	19.95
Kodak Reflex IIA f3.5	39.50
Rolleicord III f3.5 Xenar syn	42.50
Rolleiflex Automatic f3.5 Tessar	99.50
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Rolleiflex 2.8C f2.8 Xenotar MX	129.50

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Revere 88S	109.50
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Complete outfit for 35mm to 2¼ to 3¼ negatives. Lenses, trays, thermometer, easel, paper and chemicals.

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Automatic Exakta VX IIA

New 229.45

Latest model with waist level finder and discontinued f2 automatic Zeiss Biotar or f1.9 Schneider Kenon, with import certificate and factory service guaranty.

	NEW	USED
Exakta Lightmeter IIA PP RF with 58mm f2 auto Biotar	429.50	—
Exakta VX IIA with PP and RF 50mm f2.8 Tessar Aut.	249.75	180.00
Exakta VX with PP and RF, 58mm f2 Biotar Auto.	—	160.00
Exakta VX with PP and RF, 58mm f2 Westagon Auto.	—	150.00
Exakta V with W.L. Finder and 58mm f2 Biotar		99.50
EXA W.L. 50mm f3.5 Tessar	74.85	49.00
EXA PP RF 50mm f2.8 Auto. Westenar	123.75	69.00
28mm f3.5 Angenieux	93.60	60.00
35mm f2.5 Angenieux	77.60	50.00
35mm f2.8 Automatic Flektagon	109.50	—
35mm f2.8 Auto. Curtagon	149.50	—
35mm f3.5 Auto. Schacht Travegon	59.50	40.00
75mm f1.9 Primoplan pre-set	49.50	
80mm f2.8 Tessar Pre-Set	49.50	39.00
85mm f2.8 Travenar Auto. P.S.	70.45	40.00
135mm f2.8 Auto. Steinheil	142.00	80.00
135mm f3.5 Travenar Auto. Pre-set	67.45	35.00
200mm f5.5 Tele-Xenar Pre-set	74.65	45.00
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400mm f5.5 Meyer Tele-Megor	149.65	85.00

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with case and chain

69.50

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49.50

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Minolta 16	39.95	20.00
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Minox B Private Eye	186.95	
Minox IIIS	139.50	65.00
Minox IIIS Private Eye	134.50	
Minicord III	139.50	65.00
Golden Knight	39.50	24.00
Stecky IIIB	21.95	14.00
Flashgun MINOX	31.90	—
Electronic flash unit	97.90	—

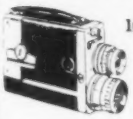
NEW 16mm PROJECTORS

	NEW
Ampro Stylist Deluxe	314.95
Bava Editor and Splicer	29.95
Bell & Howell 16mm Statesman 273	219.95
Bell & Howell 16mm Diplomat 173	299.95
Bell & Howell 385C Sound Proj.	499.95
Bell & Howell 302E Sound	765.00
Craig Editor and Splicer	59.50
Kevstone Belmont	134.50
Revere P48E 750 watt	120.00
Revere SP16 Sound 750 watt	243.75
Wollensak 6S 750 watt	149.50
Radiant Picturemaster 50 x 50 Crystal Beaded Tripod Screen	19.95

CONTAFLEX & RETINA REFLEX

Contaflex I	87.00
Contaflex II	94.50
Contaflex III	117.00
Contaflex IV	132.00
35mm Pro Tessar	70.00
80mm Pro Tessar	78.50
Accessory Shoe	1.50
Retina Reflex with 50mm f2 Xenon	142.50
Retina IIC with f2.8 Xenar 50mm	79.50
Retina IIIC with 50mm f2 Xenon	99.50
35mm f5.6 Curtar wide angle	44.25
35mm f4 Curtar wide angle	54.50
40mm f4 Longar telephoto	54.50
B.C. flashgun	5.95

All accessories for Contaflex and Retina cameras in stock, write for quotations.



16mm MOVIE CAMERAS

	NEW	USED
Bell & Howell Electric Eye Magazine 200EE f1.9	329.95	195.00
Bell & Howell Electric Eye Roltrim 240EE	329.95	—
Bell & Howell Autoload f2.5	174.95	59.50
Bell & Howell 200T f1.9	244.95	119.00
Bell & Howell 200TA f1.9	289.95	129.00
Bell & Howell 70DR f1.9	385.50	195.00
Kodak Royal Mag. 16 f1.9	—	49.50
Kodak K-100 Magazine Turret f1.9	252.75	—
Revere Magazine f2.5	127.00	60.00
Revere Mag. 3 Lens Turret f1.9	168.50	80.00
Wollensak Model 91 Magazine f1.9	140.50	—
Wollensak Model 93 Magazine, 3 Lens Turret	215.50	—

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8mm MOVIE CAMERAS

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	NEW	USED
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B & H 172B with f1.9	121.50	79.50
B & H 172A f2.5	121.50	79.50
B & H 172A f1.9	143.50	97.50
Bauer 88B	107.95	89.50
Bauer 88E	119.95	
Kodak Brownie f2.3	22.50	15.00
Kodak Magazine 890 f1.9	—	59.50
Revere Magazine 70 f2.5	—	49.50
Cine Kodak 60 f1.9	—	34.50

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MAN with a CAMERA

G.E. Lamp Department's new TV series ties in honors for local photographers

TV star Charles Bronson plays role of free-lancer in adventure series beginning Oct. 10.

Amateurs and professionals across the nation who have contributed to their communities through photographic work will be honored in connection with a new television series, *Man With a Camera*. The weekly adventure show, sponsored by the Photo Lamp Department of General Electric Company, will appear on the ABC-TV network beginning Oct. 10.

Along with the showing of the series will be an organized search for the cameramen or women, amateur and professional, who have made the greatest contribution to the community with their photo work. The amateur could be a camera fan who's campaigning in his town for play-streets and makes a picture story to prove his point. The pictures may not even have been published, but are important if they serve the community.

A nation-wide search for photographs such as these will be conducted in each of the 70 areas covered by the ABC network. Community organizations, working with local TV outlets, will select the pictures that meant the most to their community welfare. A typical committee of "selectors" might include the chief of police, clergymen, newspaper editor, press photographer, school principal, photo dealer, and service club president.

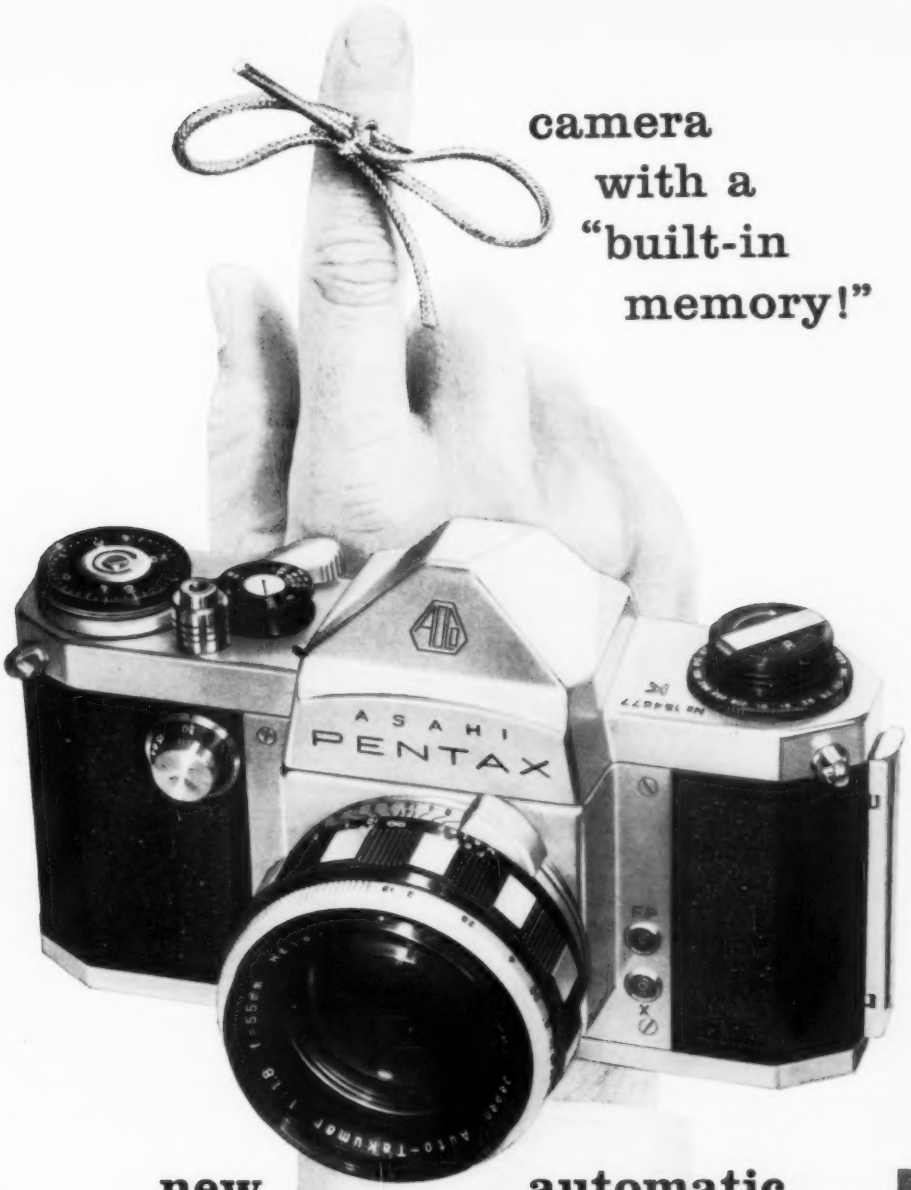
Photographers in each area will be informed of the details for selection in their community through their camera clubs and other associations. When the local professional and amateur are chosen, they will be interviewed on radio and TV, and their pictures will be widely publicized. The chief criterion in choosing them will be: "How has his or her work with a camera helped the community to be a better place, aided law and order or brought a higher standard of education—in short, made the world a better place to live in."

For many years photojournalists have used their cameras to bring social problems more forcefully to the attention of an apathetic public. Press, magazine, and many amateur photographers have helped their cities this way. Now those who have performed this service in recent years will be honored. Photographers selected will receive in addition to the public recognition a plaque detailing their efforts.

The "Man with a Camera" show will also help to dramatize the work of these other unsung heroes. To insure complete technical accuracy, General Electric has retained two advisers to check every detail of still-camera shooting before and during the filming of each of the TV episodes. The Eastern adviser is POPULAR PHOTOGRAPHY's David B. Eisendrath, Jr., while on the West Coast Joe Benetti of the *Sacramento* (Calif.) *Union Press* will sit in on the filming. Both can call upon a lifetime of experience in the field.

The star of the TV series, Mike Kovac, as played by Charles Bronson, is a free-lancer with the best qualities of today's photographers who frequently serve their communities in the finest traditions of photojournalism. He will be a far cry from the stereotype of the fast-talking, picture-snatching roughneck who existed only in Hollywood movies.

While the fictional Mike Kovac will help millions of viewers get a better idea of America's photographers today, the local "Man with a Camera" selections will also demonstrate the important work being done by the nation's cameramen.—



camera with a "built-in memory!"

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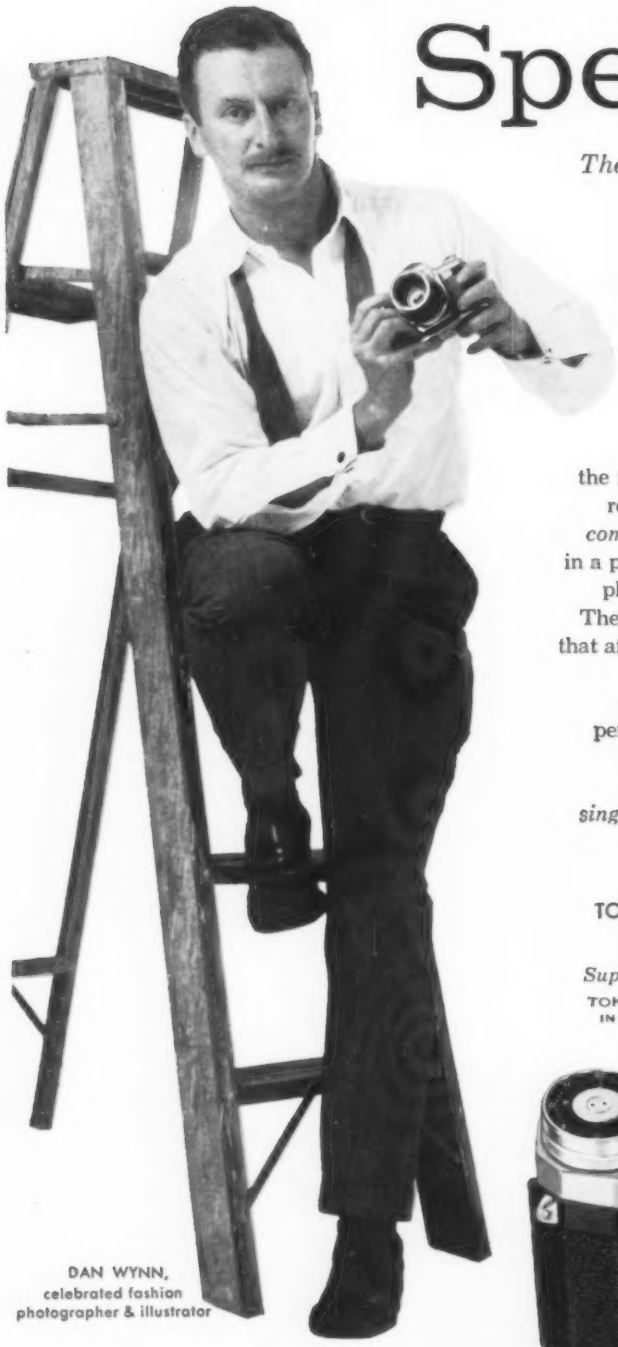
Frankly Speaking...



DAN WYNN,
celebrated fashion
photographer & illustrator

The new TOPCON "R" 35mm *Single-Lens Reflex is*
NOT *as simple to use as a box camera*
NOT *made for the novice snap-shooter*
NOT *a so-called "electric-eye-automatic"*
NOT *mass manufactured in great quantities*
NOT *small enough for your pocket*
NOT *the lowest cost single-lens reflex*
NOT *able to "think" for you*

BUT...

the new TOPCON "R" 35mm SINGLE-LENS REFLEX represents the culmination of single-lens designs . . . the *complete* camera that embodies *every* professional feature in a professional camera! The camera that does more for the photographer, by freeing him for the *art* of photography. The TOPCON "R" embodies the automatic-return mirror that affords *"follow-thru"* viewing; a range of fully-automatic TOPCOR lenses, the world's sharpest and fastest; interchangeable viewing hood and brilliant split-image pentaprism; 11 speed synchronized focal plane shutter to 1/1000th second; single-stroke automatic advance . . . *and many more features never before combined in a single-lens reflex!* These, added to the ability to use the vast variety of lenses available for Exakta-mount cameras, make TOPCON "R" prime choice for the specialist!

TOPCON "R", with 6-element 58mm f1.8 Fully Automatic Diaphragm TOPCOR Lens is available for $269.50.

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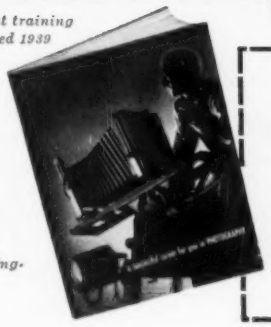

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BOLEX H-16M

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Only **$200.00**

with new, faster
Lytar 1" F:1.8 F.M. lens

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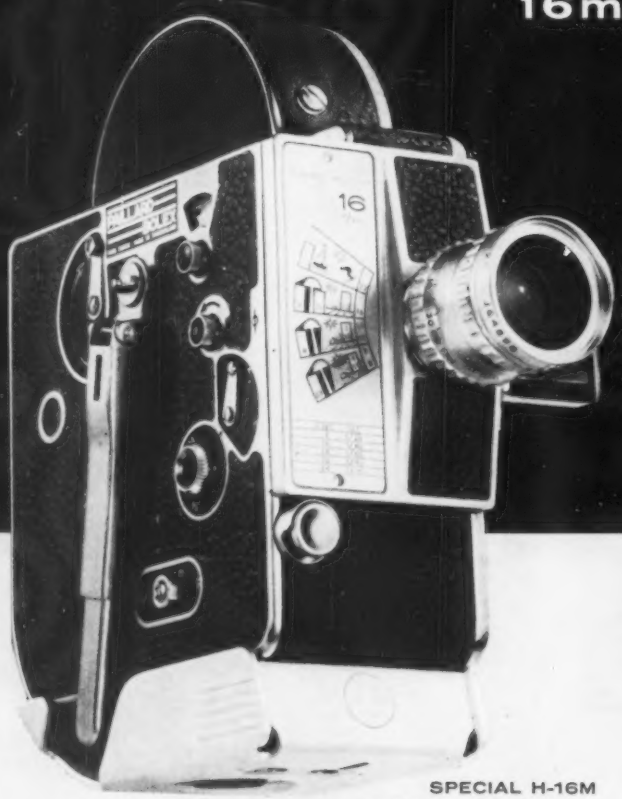

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THE NEW BOLEX H-8T

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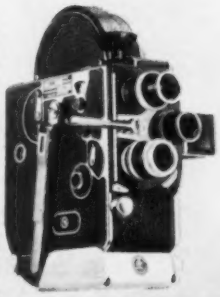

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H-16T

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The most precise 16mm mechanism that Swiss craftsmanship can provide, the new Bolex H-16T gives you instant choice of standard, wide angle and telephoto shots . . . speeds from 8 to 64 fps . . . hand-winding backward and forward for trick effects . . . continuous run lock . . . time exposure . . . automatic threading...single frame controls... footage and frame indicators . . . constant film speeds with automatic cut-off on rundown to avoid spoiled footage . . . plus through-the-lens focusing and optional filter slot (both in turret assembly). Also featured with this new model is the "Preview-Finder" for ready optical adjustment to all lenses on the three-lens turret plus special attachments as described below. Ask about the new Bolex H-16T today.

ONLY $250.00

with the new faster Lytar 1" F:1.8 F.M. lens.

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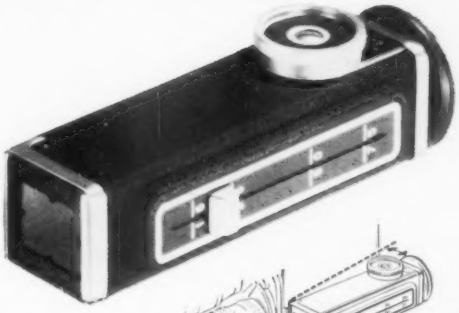

Provides clear full-sized "preview" image of scene as camera will take it with 4 separate lenses. Zooming capacity:

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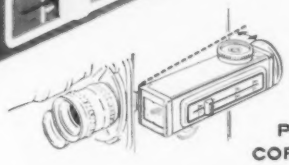

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The Range

Editorial

Thanks to You

In case you aren't aware of it, you're reading the leading photographic magazine in the U.S.A., and the reason for that is *you* and 400,135 other photographers who read POPULAR PHOTOGRAPHY every month. That figure—400,136, including you—represents the average net paid monthly circulation for the first half of 1958, and it isn't too far from being equal to the combined circulations of our two competitors!

That's not just a claim, but a fact confirmed by the Audit Bureau of Circulation, a non-profit service organization known among publishers and advertising agencies as ABC. Since its primary function is to keep a sharp eye on the way magazines count their readers we felt you'd be interested.

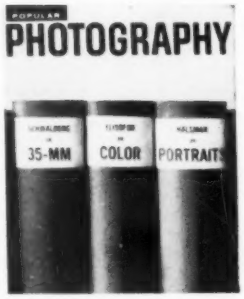
The Audit Bureau of Circulation came into being in 1914 to set standards and audit circulation figures for its member publications. The purpose was to replace claims with facts about magazine circulations. This was accomplished, and still is, by periodic audits of circulation records. Which means that member publications, which display the ABC symbol reproduced above, are accurately rated.

ABC authenticated reports provide advertisers with dependable ratings with which they can measure a magazine's worth as an advertising medium.

But the *real* evaluators of a magazine are its readers. Thus when you buy POPULAR PHOTOGRAPHY month after month you are helping the magazine to maintain its conspicuous leadership, making it possible for you to continue enjoying the benefits of the largest and most authoritative staff of editors in our field, who consistently provide the best articles and pictures in the U.S.A. Nothing succeeds like success, and it is a pleasure to share that success with our readers.

Leadership, made possible by your loyalty and made official by ABC, pays off all around! We appreciate your continuing support.

Next month



THREE COMPLETE NEW BOOKS!

GETTING THE MOST FROM 35 MM
By
Bob Schwalberg

COLOR PHOTOGRAPHY
By
Eliot Elisofon

PSYCHOLOGICAL PORTRAITURE
By
Philippe Halsman

PLUS:
Pre-photokina product reports

finder

News and comment by the editors

To meet ever-growing demand, a new workshop series

Americans have shot more than two billion pictures during 1958, says *Life*. The number has climbed steadily since photography was a pup, and it has a lot of climbing yet to do. POP PHOTO, as always, keeps pace. This month we announce the inauguration of a new series of publications: *Popular Photography Workshop Annuals*, which will appear at regular intervals, dealing with subjects of the greatest interest to you and the hundreds of thousands like you. First to appear will be HOME MOVIE MAKING, prepared by the movie staff of POP PHOTO, which will be on newsstands just three weeks after this November issue. Some intriguing titles from its table of contents: *Be Glad You're a Beginner, How to Make an Old-Fashioned Comedy, The Easy Art of Titling*. The book's climax is a 16-page pulp supplement, *Secrets of Successful Movie Making* by Charles Reynolds (who also writes about the book in his column, *Creating with Film*, this month). Watch for HOME MOVIE MAKING, and for announcement of the next *Workshop Annual*.

Skilled journalist, good friend

The fraternity of photographic writers and editors was saddened by the sudden death on August 2 of George B. Wright, regular POP PHOTO contributor, author of our *Moneymaking Ideas* column and of numerous books including *The Nikon Manual of 35-mm Technique, Available Light and Your Camera*, and *A Guide to Perfect Exposure*. He was editor of *American Photography* until that magazine was absorbed by POP PHOTO five years ago, and subsequently editor of American Photographic Book Publishing Co. His easy skill and dependability will be missed by all who worked with him, and his genial warmth will be remembered by those who knew him as a friend.

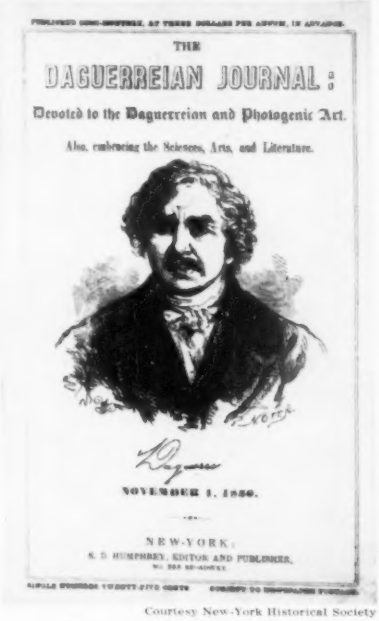
A few days after Wright's passing, we learned of the death of another good friend and photographic journalist, Pierre de Rohan, who, under the name of John Adam Knight, wrote the weekly camera column for the *New York Post*.

Seven-Wonder winner soon

Judges are pondering the thousands of entries in POP PHOTO's Seven Wonders of the World Contest, chuckling at the humor of some, admiring the rare imagination of others. They promise a decision soon, but won't tell us just how soon. Watch and wait with us; maybe you'll be circling the world before you know it!

The first kind of photography

It has been 120 years (give or take a few months) since Daguerre's announcement of his most famous invention—with the words, "Their exquisite perfection almost transcends the bounds of sober belief . . . most terrific facsimiles of the human visage. . . ." Now the Daguerreotype is getting a show all to itself, at the New-York Historical Society, most of it on loan from George Eastman House in Rochester. It will run through the month of November, and is worth a side-trip for anybody passing near New York. Among the interesting items is a copy of the world's first photo magazine, whose cover we reproduce here. Note the hedging phrase: "Also, embracing the Sciences, Arts, and Literature." Presumably in case "Daguerreian and Photogenic Art" was just a passing fancy!


THE
DAGUERREIAN JOURNAL:
Devoted to the Daguerreian and Photogenic Art.
Also, embracing the Sciences, Arts, and Literature.
NOVEMBER 1, 1850.
NEW-YORK:
S. D. HUMPHREY, EDITOR AND PUBLISHER.

Courtesy New-York Historical Society

FIRST PHOTO MAG ANYWHERE
Dedicated to "terrific facsimiles."

Candid Shots

Don't throw out any old prints! Volunteer Service Photographers needs them for handicapped patients to oil-color. Send them to VSP, 113 W. 57th St., New York 19, N. Y. . . . A Kodak scientist threw out an interesting tidbit the other day: the lens of the human eye has a maximum aperture of about f/2—meaning science has beaten nature again . . . Octogenarian **Alexander F. Victor**, pioneer inventor of motion picture apparatus (as well as the first electric washer-dryer) now lives in Carmel-by-the-Sea, Calif., would like to hear from old friends in the industry; he's writing a book on movie history and development. . . .

NOVOFLEX

DOES A MAN-SIZED JOB that a man can appreciate FOR 35mm CAMERAS

PISTOL-GRIP FOLLOW FOCUS LENS

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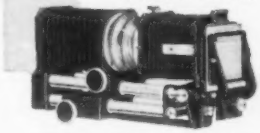

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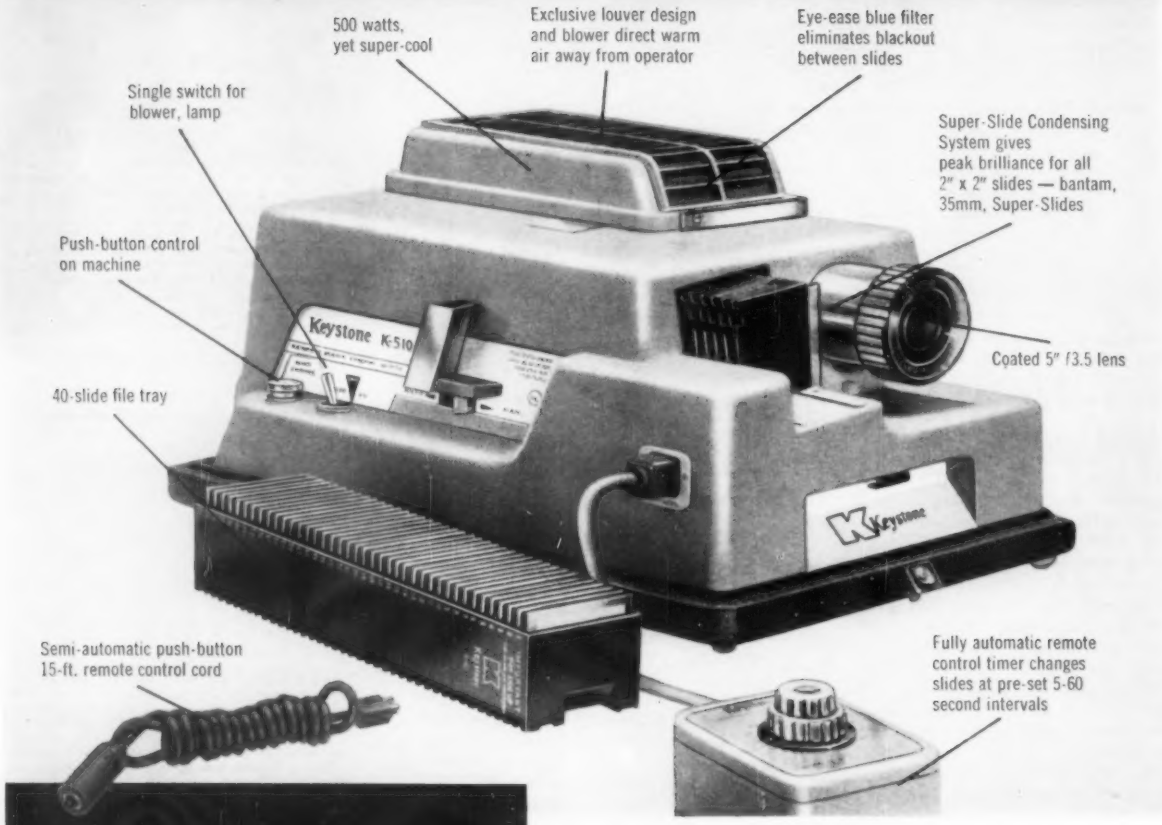

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POPULAR PHOTOGRAPHY
NOVEMBER, 1958

Have you outgrown your equipment? Is your photography slipping because your camera can't keep pace with you? These questions will help you

RATE YOUR CAMERA

You owe it to yourself to own a camera that matches your needs and your ability. You may have bought your present one five or ten years ago; perhaps by now your interests have changed, and certainly your picture-taking skill has grown. Here is a list of questions to help you determine how well your camera is serving you. Check through them, then turn to page 88 for suggestions on bringing your equipment up to date, either by replacement or adding new accessories.

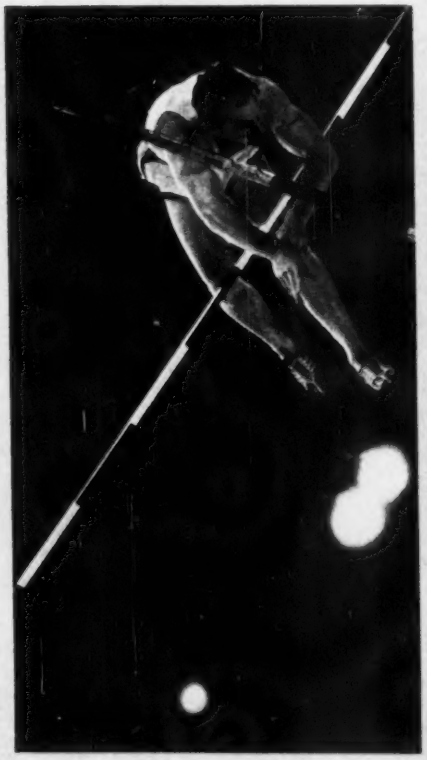
	Yes	No
Is it difficult to operate your camera quickly?	☐	☐
Do you have trouble seeing through your viewfinder?	☐	☐
Are you getting out-of-focus pictures?	☐	☐
Are you missing pictures because subject matter is too far away?	☐	☐
Are you missing pictures because subjects are too large or too wide?	☐	☐
Have your camera's limitations kept you away from the close-up world?	☐	☐
Do you have trouble shooting pictures unobtrusively?	☐	☐
Is your lens too slow for available-light shooting?	☐	☐
Is action blurred even at your fastest shutter speed?	☐	☐
Do you cut off tops of heads even though you frame carefully?	☐	☐
Does action "run out of your picture?"	☐	☐
Do you miss pictures because you can't wind film fast enough?	☐	☐
Do you have difficulty loading your camera?	☐	☐
Is it inconvenient for you to change from black-and-white to color?	☐	☐
Do you fail to get enough pictures in a situation?	☐	☐
Do you miss pictures you might have made with flash or speedlight?	☐	☐
Do you find carrying an exposure meter a nuisance?	☐	☐
Do you leave your camera at home because it is inconvenient to carry?	☐	☐

HIGH-SPEED-FILM

Available-light pictures like these are easy with fast emulsions

ROUNDUP

on the market today



By BOB SCHWALBERG
Photographs by the author

The modern high-speed film is a photographic paradox without peer or parallel. Able to record more detail with less exposure, these super-fast emulsions enable available-light photographers to use higher shutter speeds and/or smaller lens openings than ever before. This same speed has, however, made it increasingly more difficult to avoid excessive negative densities with the attendant faults of increased graininess and impaired gradation and sharpness.

Viewed either with admiration (*as a major achievement in the science of emulsion-making*) or with alarm (*as a destroyer of sound photographic standards*), these "available-darkness" films present both a promise and a threat: the promise of brighter available-light pictures with less subject movement and more depth of field; the threat of mush and muddiness, grain and glop.

If you have never tried making available-light pictures with the fast films available today, you have an exciting experience ahead of you. But whether you're a beginner or already an aficionado of photography by the light that is, you may need to change your thinking about exposure and development in order to get the best quality of which these films are capable.

The chart on the following two pages —the result of exhaustive comparison tests of 8 fast films in 8 popular developers—will give you the basic data you need. But equally important is the reasoning behind the way professionals and advanced amateurs regard film speed and development today. More and more, the manufacturers' recommendations, based on American Standards Association procedures, are being replaced by practical "user indexes" of two and three times the ASA speed rating—*with no increase in developing time.*

To understand what all the shooting is about we must go back to the early post-war years which witnessed a popular reaction against the preceding era of the large-format camera and multiple-extension flash. Available-light photography with small-format cameras (mostly 35-mm and 2¼x2¼ reflexes) came about primarily as a means of reintroducing unobtrusive naturalness and simplicity at a time when the dominant characteristics were slickness, artificiality, and heavily obtrusive camera and lighting techniques.

The gravelly-grain era

Then-available films did not, however, have anywhere near enough speed to do the job demanded of them. The fastest U. S. roll films of the period were Ansco's Ultra Speed Pan and Kodak's Super-XX, which had Weston ratings of 125 and 100 respectively. But the job needed doing, and photog-

raphers turned to forced film development with a will.

Thus was ushered in the era of gravelly grain, klieg-light contrast, and generally execrable print quality. Nevertheless, it was a visually exciting period which saw the production of a lot of very wonderful pictures and some of the most memorable picture stories, as well as the development of some very powerful photographic personalities.

A reaction against poor available-light quality soon made itself felt. Picture editors, art directors, and assorted critics complained loudly, and with much justice. While most supported the aims and objectives of the available-light school, pleading not for *less* but for *better* available-light techniques, many did (and some still do) question the validity of available-light photography as a whole.

Responding as much to criticism from within as from without, available-light workers learned to expose more and to force less; to choose soft-working rather than harshly contrasty film developers; to use slower films (like the old brown-cassetted Plus-X which had a tungsten rating of 40) wherever possible. As a result, available-light quality improved very considerably, and save for the professional grain-haters to whom the physical characteristics of a print are of far greater importance than any conceivable amount of visual content, the idea of taking pictures indoors without resort to additional photographic lighting gained wide acceptance among professionals and amateurs alike.

Comes the revolution

Then, in 1954, the current black-and-

How to expose and develop

FILM		GENERAL DESCRIPTION:	MANUFACTURERS' ASA RATINGS (Bold face, daylight; light face, tungsten)	OPTIMUM EFFECTIVE FILM-SPEED RATINGS[a]
Agfa	Isopan Ultra	High red-sensitivity. Has exceptionally clear base, providing exceptional brilliance. Gradation and sharpness excellent. Better than average high-speed film grain.	**250**/320*	500—650
Ansco	Super Hypan	Newest high-speed film *(see Aug. Pop. Photo.)* with grain, gradation and sharpness similar to films in medium-speed category.	**	650—800
Gevaert	Gevapan 36	Very fast, relatively grainy material with high fog-level, low contrast, very long tonal scale.	**250**/160	800—1,000
Ilford	HP-3	HP-3 is somewhat finer grained and more contrasty than HP-S. Higher HP-S speed ratings reflect greater pushability of inherently flatter film, but both give optimum results at approximately equal effective speed indexes. See text.	**200**/160	650—800
	HP-S		**400**/320	800—1,000
Kodak	Tri-X	Tri-X is medium-contrast, moderately grainy hi-speed film with good "pushability."	**200**/160	650—800
	Royal-X Pan	Royal-X is fastest film made today. Requires sheet-film development techniques to realize speed, and gives grainy result.	***	1,600—2,400
Perutz	Peromnia 25	High red-sensitivity. Relatively grainy low-contrast film with good gradation, particularly in shadows.	**250**/320*	650—800

N-R—Not Recommended
N-T—Not Tested

*
Higher tungsten rating due to specially high red-sensitivity of the film. Giving the amount of additional daylight exposure (approximately ¼ stop) indicated serves to eliminate any unnatural darkening of red subject-matter such as feminine lipstick. In practice the optimum indexes found in column 5 will provide best results.

**
Ansco has announced that if measured according to the ASA method, "an index of 200 daylight, 160 tungsten is obtained" for Super Hypan. However, for optimum results the company advises that "the user should set his exposure meter for: Daylight 500, Tungsten 400."

white era was inaugurated by two very different events. The first of these was the introduction by the Eastman Kodak company of two new high-speed films (Royal Pan sheet film and Tri-X roll and 35-mm films) which offered a tremendous increase in effective film speed while holding the quality level of the slower materials which they replaced. At the same time, these new emulsions, and the many similar products hastily introduced by other manufacturers, profoundly changed the available-light photographer's *development* technique, his attitude toward manufacturers' published film-speed indexes, and his standards of available-light print quality.

These changes stemmed from a number of basic differences between the new high-speed films and the materials which they replaced. In practical terms, the differences were these: With the older (pre-1954) films, forced development resulted, first, in excessive contrast, second, excessive graininess, and third, in image-destroying fog. With the new films, however, forced development reversed this order of error, resulting first in excessive graininess, and only secondarily in excessive contrast. This doomed the whole business of forcing, almost immediately. And as a matter of fact, when Tri-X was first introduced (and for very many months thereafter) the official Kodak recommendation for development in D-76 was 16 minutes. However, despite the fact that they were using very much higher effective speed ratings than the 160 tungsten rating given by the manufacturer, most professionals soon found that the maximum time advisable was approximately continued on page 96

8 high-speed 35-mm and roll films

DEVELOPING TIME IN MINUTES AT 68-70 F WITH INTERMITTENT AGITATION							
Kodak D-76	Kodak D-23	Ethol UFG	May & Baker Promicrol	Ilford Microphen	Ansco Permadol	Ansco Normadol	Kodak DK-60a
9-10	11-12	5½-7	11-12	11-12	5-6	12-14	N-R
9-10	11-12	5½-7	11-12	11-12	5-6	12-14	N-R
11-12	12-13	6-8	12-14	N-T	N-R	N-T	N-R
10-12	12-13	6-8	12-14	12-13	N-R	13-15	N-R
12-13	13-15	7-9	13-15	14-16	N-R	N-T	N-R
10-12	12-13	6-8	12-14	12-13	N-R	13-15	N-R
N-R	N-R	N-R	N-R	N-R	N-T	N-R	8-11
10-12	12-13	6-8	12-14	12-13	N-R	13-15	N-R

***
Kodak has announced that when measured by the ASA system, Royal-X Pan would have an ASA exposure index of 650. However, for best results the company advises the use of an index of 1,600. Royal-X Pan is available only in sheet-film sizes and 120/620 rolls. No 35-mm spoolings are available.

a
These optimum exposure indexes are based upon a minimum amount of exposure necessary to record important shadow detail and are offered for use with ASA-calibrated exposure meters. They involve no increase over normal development times, and were obtained solely by eliminating all or most of the safety-factor built into ASA-determined exposure indexes.

This close-up was made while doing a story on an oil worker in Texas.

A veteran photographer urges his fellow workers to take a good look at and then begin tapping the

world's LARGEST *photo market*

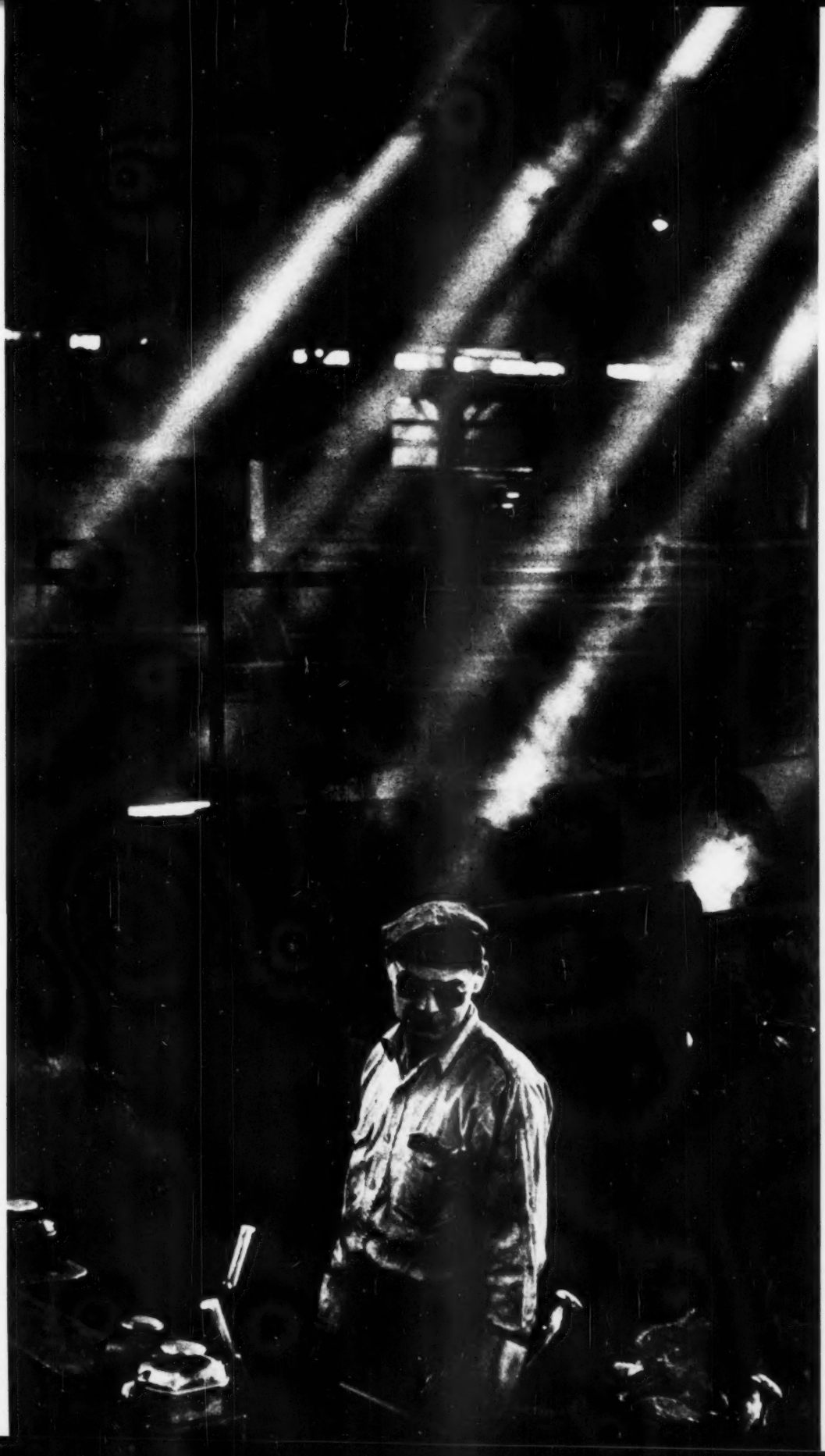
By *SIMPSON KALISHER* Photographs by the author

An employee and his family was the subject of a human interest story I did for a company publication.

The world's largest market for photographs — the field of house organ journalism (or the company magazine)—remains largely untapped by today's photographers. More than 8,000 house magazines are being published today, using about a quarter of a million photographs each month.

Before some adventurous professional yawns or shrugs his shoulders, let me point out that my work with house magazines has taken me on a submarine trip for a story on underwater medicine, to faraway places like Puerto Rico and Nova Scotia, to oil camps in Texas and steel mills in Ohio. The jobs have been challenging and varied, and the chief difference between working for house publications and newsstand consumer magazines is that I have felt freer on assignments with the former.

Too often I have been on assignments for the "slicks" when the story line and conclusion was originated by someone hundreds of miles from the story. That the gimmicks selected to tell the story had little to do with the facts didn't matter. The story line was set, and I had to shoot it that way. This has seldom if ever happened to me while shooting



I went to a steel mill to make this shot for an oil company's publication for stockholders.

Photographs courtesy The Texas Company, Chevrolet *Friends*

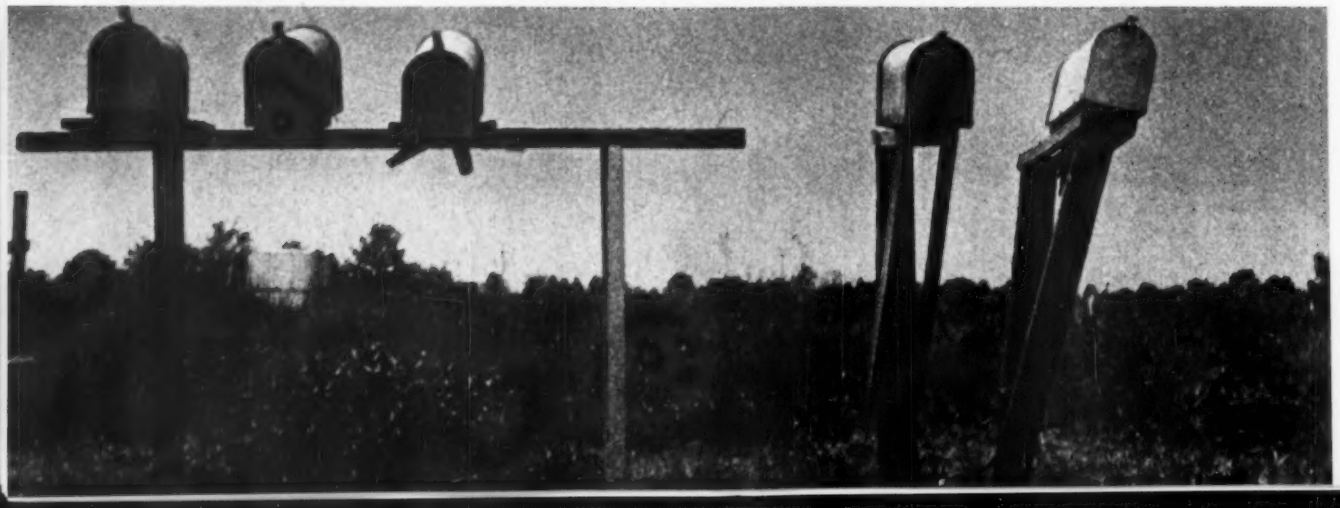
stories for my industrial clients. And that means I've been able to dig and do what I consider valid photojournalism for them.

Because the house organ field is so large and so varied, it offers the novice an opportunity for a start and the highly paid professional his milieu. Industrial, manufacturing, and service firms frequently call upon the services of a commercial photographer or a photojournalist, even though many of them have staff photographers or else usually take their own pictures. They may want a sharp rendering of a machine, a picture story on an employee, an impressionistic look at their facilities, a human interest shot of a child, or a news-type picture of one of their products.

Before American industry committed itself so deeply to house publications, it used photography chiefly to illustrate products and processes for advertising. When a photographer went to a plant or office, his

An automobile company's magazine for customers had me do this general interest story on a small theater group in New York.

Rural mailboxes gave me this abstract still life while doing a community story for an oil company's "internal."



The dynamic visual quality of American industry is typified by this giant oil rig which I photographed as part of a story on product development.

visit was generally preceded by a vast clean-up-and-paint operation that may have taken weeks. He would then set up his 8x10 view camera, a battery of lights, and go to work. Usually production stopped while men and machines stood still for his time exposure.

The development of fast, fine-grain films coupled with the increased use of the 35-mm camera has changed all this, and now the photographer can move about a plant quickly and unobtrusively in the best tradition of the photojournalist. Also, companies have been educated to realize that razor-sharp, unanimated photographs are not necessarily the best way of telling their story to employees, stockholders, customers, dealers, and retailers.

Working without a preconceived story line helped me get this candid portrait of washday, for I was permitted to really dig into the lives of my subjects.

When house organs made their initial and often cautious appearances, they were frequently produced by someone who had little interest or training for the job. Many times an overworked advertising or personnel department would handle it as just one more chore. Gradually, however, as more money was expended on this valuable instrument of employee and community relations, professional journalists entered the field. And house organs began to take on a smarter look, which meant increased and expert use of photographs.

House organ editors saw and imitated the success of *Life*, *Look*, and the other magazines using pictures effectively. They realized they were competing continued on page 107

COPY YOUR COLOR SLIDES

Automatic-focus devices make slide duplication easy

By OTTO BAYER

Making duplicates from color slides is a fascinating branch of color photography. Aside from the fact that you may need duplicates for friends (or relatives) or that you may want to protect a set of valuable originals, there are possibilities of doing really creative duplicating.

By choice of film and filters, you can alter color balance either to restore proper balance or to create a different effect or mood. You can also influence contrast by choosing the proper color film. Changes introduced during processing of Anscochrome and Ektachrome can influence your results still further.

In some slides the important matter is surrounded by irrelevant "spinach." By cropping this out and duplicating only the subject matter, you can come up with a more effective result.

In the past you may have hesitated to make your own duplicates. It meant making relatively complicated bellows or extension tube setups and involved multitudinous exposure calculations and recalculations. The devices shown on these pages require a minimum of knowledge to set up properly, as there is no need to focus.

Most of them make 1:1 (or same-size) duplicates. Others can make enlarged duplicates or may be used in some instances to crop out portions of slides. (They may also be used with negative films to make color prints or with black-and-white films to make conventional prints.) The Testrite Cinelarger, for instance, makes 8 enlarged duplicates on a roll of 620 color film. Material being copied can be changed without affecting the exposed portion of the roll.

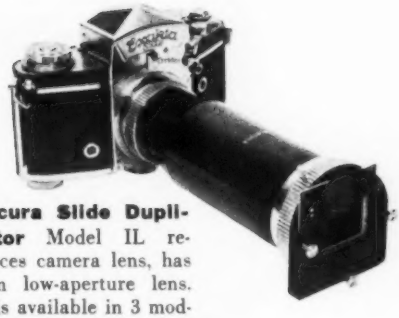
The Accura Slide Duplicators Models 44 and 50 may be used to make enlarged duplicates by attaching them to 2¼x2¼ or larger cameras. These duplicators may also be used with noninterchangeable-lens cameras to make same-size (1:1) duplicates from 35-mm slides.

The Voigtlander Macro Unit for the Prominent camera makes both 1:1 or 2:1 duplicates, depending on combination of lens and other equipment. The latter magnification is continued on page 94

Here are 6 automatic-focus devices for making duplicates

Zeiss Contakop uses a fixed extension tube and any 50-mm interchangeable lens having a Contax type mount. It makes same-size duplicates.

Leitz Belun (similar to Contakop, left) fits all cameras with Leica-type lens threads. The focal frame shows exact area seen by camera's lens.



Accura Slide Duplicator Model IL replaces camera lens, has own low-aperture lens. It is available in 3 models for 35-mm cameras.

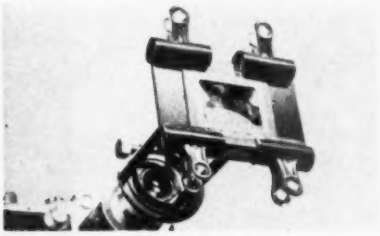
Voigtlander Prominent Macro units supplement camera's 50-mm lens; up to 2:1 magnification ratio is useful in making cropped copies.

Accura Slide Duplicator Models 44 and 50, for fixed- or interchangeable-lens 35 to press-size cameras, make 1:1 or enlarged copies.

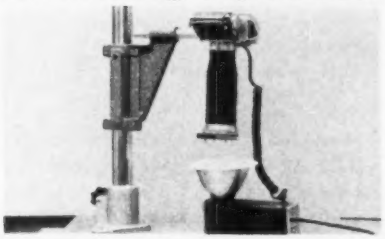
Testrite Cinelarger has built-in copy lens and time-exposure shutter. It makes eight different duplicates (about 2x3 in.) on 620 roll film.

. . . and here are 3 lighting setups for making exposures

Light box or contact printer provides illumination for units similar to above. Suspend other types from copying stand.



Daylight, as a source of illumination, necessitates clipping or taping slide mount to the focal frame of unit.



Electronic flash illumination utilizes a copying stand. Other setups include an elevating tripod or a clamp-on bracket.

"If only I could have switched to a faster film for this shot."

"I wish there had been color in my camera when I took this one."

Here are nine solutions to a problem that's faced most photographers at one time or another

HOW TO SWITCH FILM IN MID-ROLL

How many times have you been faced with this problem: *the film in your camera isn't the right one.*

Possibly the subject moved from an available-light situation (where fast film is a must) to a bright, sunlit area (where a slower film would get better results), or you may have wanted to switch from black-and-white to color. For such problems, there are several possible solutions which are listed below. Among them, you will most likely find one or two that will satisfy your needs.

TWO CAMERAS. Obviously, the simplest solution is to have two cameras, but this can be rather expensive. You can load each with a different emulsion. Shooting outdoors you may want both black-and-white prints and transparencies. Load one camera with color, and the other with black-and-white. Or, you may want to load one camera with a negative color film and the other with a fast color transparency film.

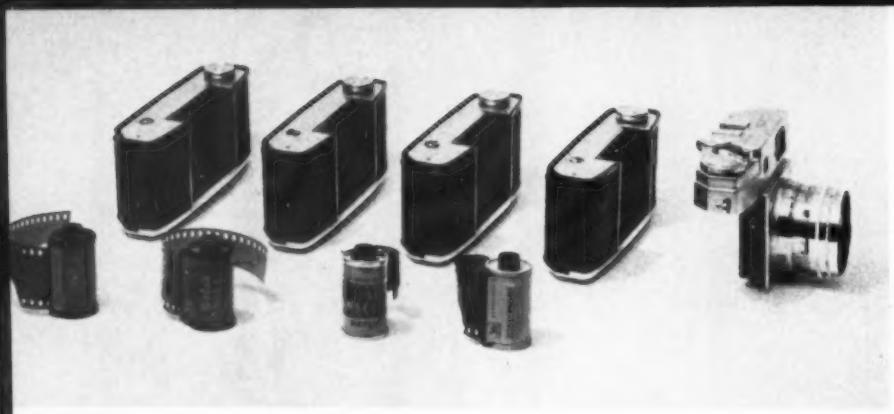
USE A SHEET-FILM CAMERA. Another method of going from one emulsion to another quickly and easily is not to use roll-film but a sheet-film press-type camera. Load different holders with different films, and you can change as quickly as you can get one holder out of the camera and a second into it. The possibilities of a sheet-film camera and film "interchangeability" are enormous. Besides being able to switch holders, you can switch roll-film backs. In a given situation, you can *first* put a Polaroid back on a camera and get a picture in a minute; *second*, you can shoot the scene in transparency color; *third*, shoot with a negative color for Ektacolor (Type C) prints, and end the session with a black-and-white film, or a variety of other emulsions.

THE REWIND SYSTEM. When using this system the 35-mm photographer must carefully set his frame counter at zero before he starts. Later, after noting the exposure number, he can rewind his film back into the cassette—turning easily to feel when the leader pops out of the take-up spool—then reloading with another emulsion. (Be careful not to wind the leader into the cassette. If you do, you will have to go into the darkroom to take the cassette apart, and bring the leader out.) To replace, the film, (1) reload, (2) cover the lens with a lens cap so light cannot enter, and (3) advance the film until it is at the point where shooting stopped.

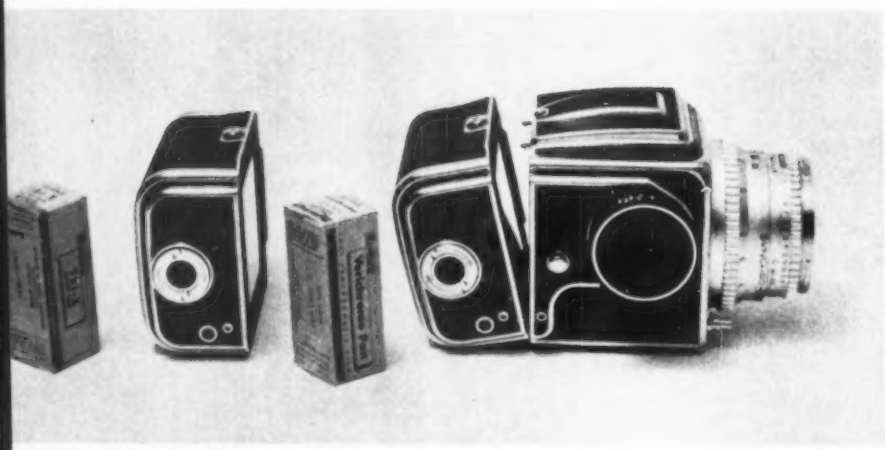
TWO-CASSETTE SYSTEM. Using cameras like the Contax or the Robot, a two-cassette system can be used. In loading, instead of attaching the leader to a take-up spool, it is attached to the inside of a cassette. Therefore, the film runs from one cassette to another. Then, should you want to switch to another emulsion, (1) advance film two frames so that your last picture will not be exposed to the light when both cassettes are taken out, and (2) switch to another emulsion using the two-cassette load again.

USE ROLL-FILM CAMERA WITH SHEET-FILM BACK. There are several roll-film cameras like the Rolleiflex that can be converted for sheet-film use by changing to a sheet-film back. With sheet-film holders, different emulsions can be loaded and you have the same freedom as the photographer with the press-type camera.

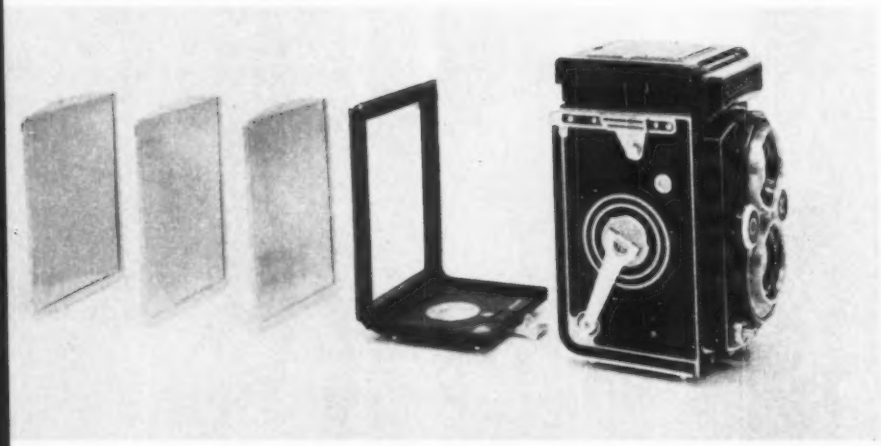
USE REFLEX WITH INTERCHANGEABLE BACK. A single-lens reflex such as the Hasselblad can



Specifically designed so that photographers can switch films quickly, the Mamiya Magazine-35 camera has magazine backs. Each back shown here can be loaded with different films and used interchangeably with others. Magazine is changed in less than 30 seconds.



Single-lens reflex that allows photographer to interchange roll-film backs is the Hasselblad. Several backs can be purchased and loaded with various emulsions. In a matter of seconds one back can be taken off and another substituted for it. Backs accept 120 film.

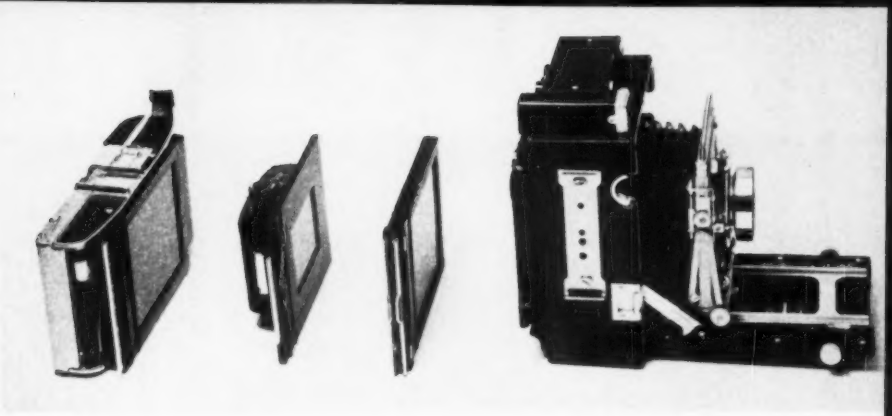


Some cameras like the Rolleiflex shown here can be adapted for sheet-film use. The roll-film back is removed and sheet-film back is easily put on. Film holders take single sheet of film. Photographer can load as many holders as he likes with a great variety of films.

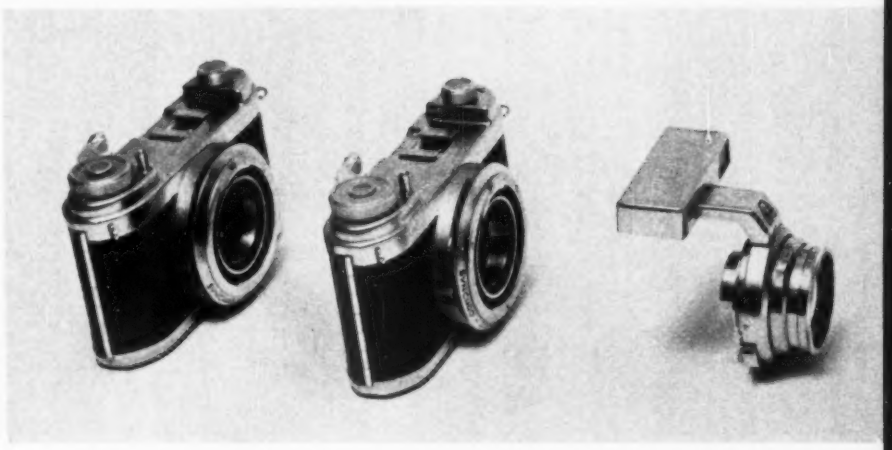
be used with as many roll-film backs as you would like. Load each back with a different film, and switch back and forth as you please. A back can be taken off, and a new one put on the camera in a matter of seconds.

USE 35-MM CAMERA WITH MAGAZINE BACKS. In less than 30 seconds you can switch magazines containing different films on the Mamiya Magazine-35 camera. The camera has been designed specifically for the 35-mm photographer who wants to change from film to film whenever he pleases. Taken apart, the front part of the camera consists of a rangefinder, viewfinder, lens, shutter and lever advance. The back part is a light-tight film magazine. Once the two parts are brought together, all it takes is a twist of a knurled wheel to make the parts a complete camera. The magazine backs have a plate that slides over the film and protects it from being exposed when the magazine is removed.

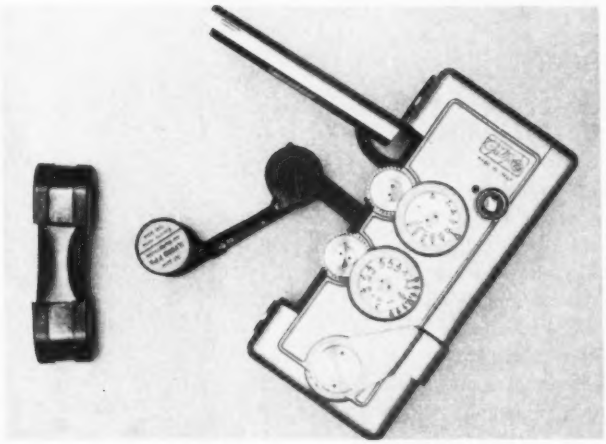
USE 35-MM CAMERA WITH INTERCHANGEABLE BODIES. The Akarex camera is an example of a 35-mm which has interchangeable bodies. The lens is incorporated in a lens-finder unit which comes off easily. The camera was originally designed to facilitate quick changes from one focal length lens to another. With the lens-finder unit, the photographer does not have to set an accessory viewfinder or use a rangefinder not meant specifically for the new lens on the camera. Should you have two Akarex bodies (or more) you can switch them readily. Or, if you have two bodies and three different lenses (normal, telephoto, and wide-angle) you can switch from lens to lens, and body to body in any way you like.



Camera that offers great versatility to the photographer who not only has to switch from film to film, but from roll to sheet film is the Speed Graphic. Here the Graphic is shown with Polaroid Picture-in-a-Minute back, roll-film back, and sheet-film holders.



Akarex 35-mm camera can be quickly taken apart. Front part consists of lens-rangefinder-viewfinder unit. Back part is camera body. With two or more bodies, photographer can have several films at his disposal. Besides switching films, lens units can be switched.



Subminiature users get their film loaded in cassettes. With camera like the Gami 16 a photographer should advance film three frames, take out cassette, and drop in another. Only three frames will be lost in the changeover.

USE A SUBMINIATURE WITH CARTRIDGES. The tiny subminiatures that have been around for years, and are now making big news, accept film cartridges. You can switch from one cartridge to another quickly, but you must remember that as you do, two or three frames of film will be exposed to the light in the change-over. So, make sure you have advanced your last picture into the cartridge before taking it out. Also, before you start shooting the next cartridge, make sure you've advanced film sufficiently to have unexposed film in position.

The new freedom offered by the above systems allow the photographer to get the picture he's after, and also to experiment.

Film manufacturers also have thought about the "switch" problem for a long time. The results of this thinking and experimentation are beginning to show up. "Universal," negative-type color film which can be used to make color prints, transparencies, and black-and-white pictures are on the market.

There are also some techniques available to a photographer who *did not* switch films in shooting, and who now wants black-and-white from color or vice versa.

1. Direct positive paper (like Kodak's Direct Positive Super Speed) is used with transparencies for black-and-white.

2. Intermediate color negatives can be made from transparencies and used for black-and-white and color prints.

3. Transparencies can be "contact printed" onto black-and-white film and the resulting negative can be used for prints.

4. Black-and-white prints can be made into color pictures by means of the Flexichrome process.

Of course there is no substitute for shooting with the correct color film.—

MY WIFE BUILT ME A DARKROOM

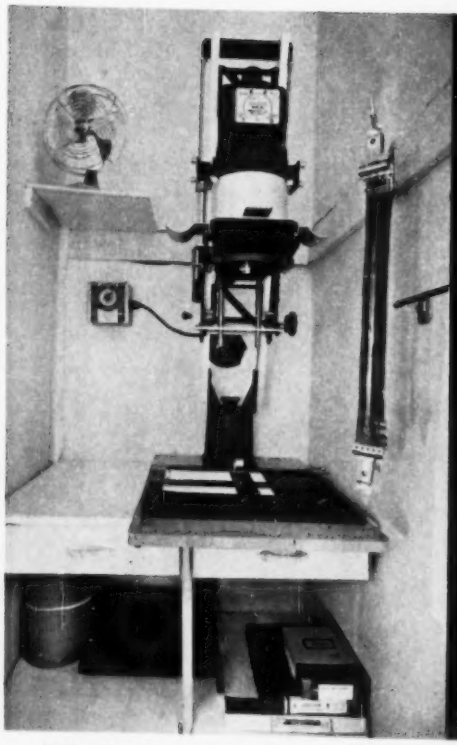
She made me a place of my own just to get my equipment out of her kitchen

By E. PETER SCHROEDER

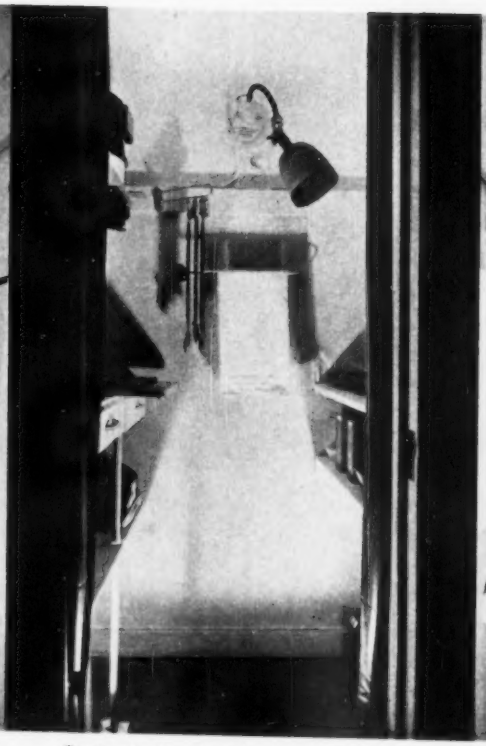
YES, it's true, my wife, Deedee, did build me a darkroom. But, let's face it, she was primarily looking out for herself even though she tries to make it sound as if the whole project was done for my welfare alone. Plain and simple, she wanted to get me, my enlarger, processing trays, and developing tanks out of her nice kitchen.

Luckily, in our apartment we have a walk-in closet which was used to store clothes, sheets, towels, and pillow cases. However, once the idea of turning this closet into a darkroom occurred to my wife, the clothes and linens soon found their way into a portable closet, and she rolled up her sleeves and went to work. The closet, which measures 5 ft 2 in. by 2 ft 8 in., first got a nice neat coat of paint. Then my wife sat down with paper and pencil and began sketching a plan. I gave her a list of all the things that would have to go into the darkroom, and with the ease and know-how of a skilled interior decorator she drew the "blueprints."

You'd be surprised what women learn about space planning just by reading the house and home magazines. I was amazed. My wife designed a darkroom that took just about every physical movement into consideration. *She actually planned both sides of the closet so I would do a minimum of turning around from one* continued on page 113

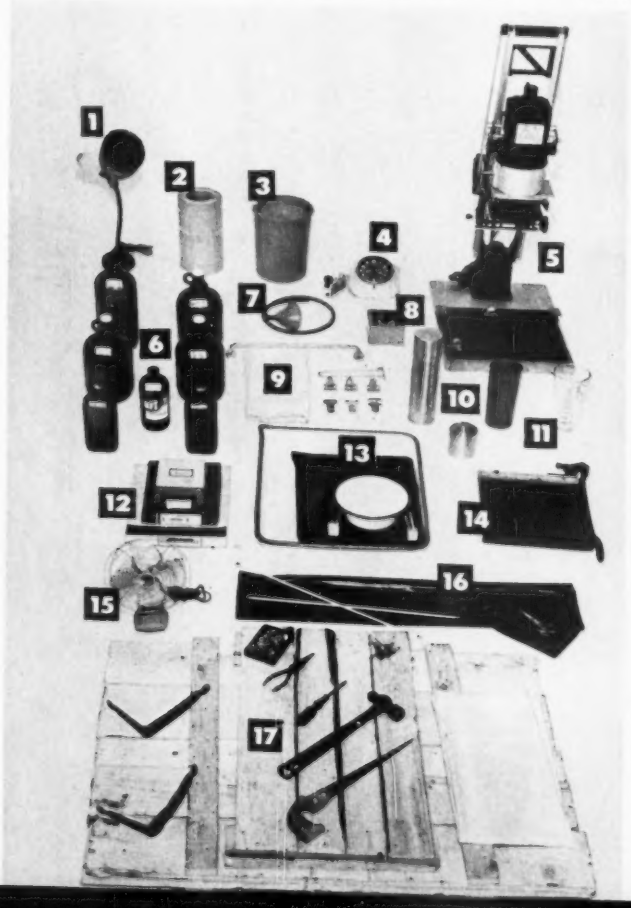


Left side of my closet darkroom looks like this. Sitting on the table is an Omega D2 enlarger, hooked into a self-timer. The fan circulates the air.



Center, looking straight through the door, you can see my safelight-room-light combination, film hanging rack and towel rack.

Right side, where my wife once kept her sheets and towels, I have my processing trays (developer, short stop, and hypo). Rinse water is on shelf below.



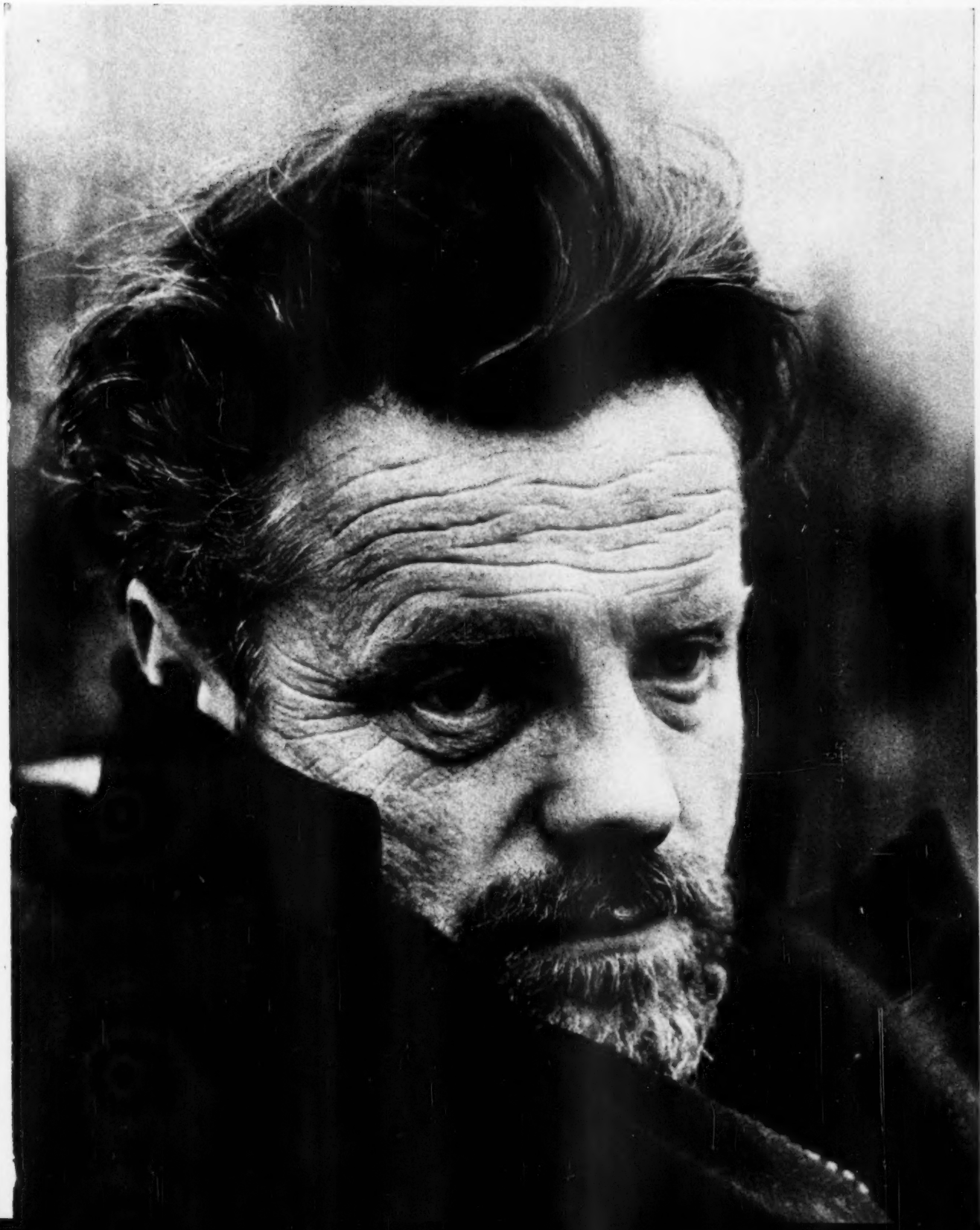
Here's all the equipment my wife used in assembling the darkroom. **1** goose-neck lamp for safelight, **2** blotter roll for print drying, **3** waste paper basket, **4** electric clock, **5** Omega enlarger, **6** processing chemicals, **7** hose and funnel for transferring liquids from bottles to trays, **8** automatic timer, **9** clips and bar for hanging negatives, **10** film processing tanks, **11** glass graduate, **12** enlarging paper, **13** trays (both 11 x 14 and 8 x 10), **14** paper cutter, **15** fan for ventilation, **16** rods and black plastic curtain (placed over inside of door to make closet light-tight), **17** hand tools, lumber, nails, and plastic sheet (used to cover enlarger table).

PICTURES

By going backstage at a Tokyo theater, Georg Oddner of Malmö, Sweden, was able to make this startling close-up of a Kabuki actor. He used a Hasselblad 1000F, 135-mm Kodak Ektar *f*/3.5 lens, exposing for 1/2 sec at *f*/5.6 on Tri-X.

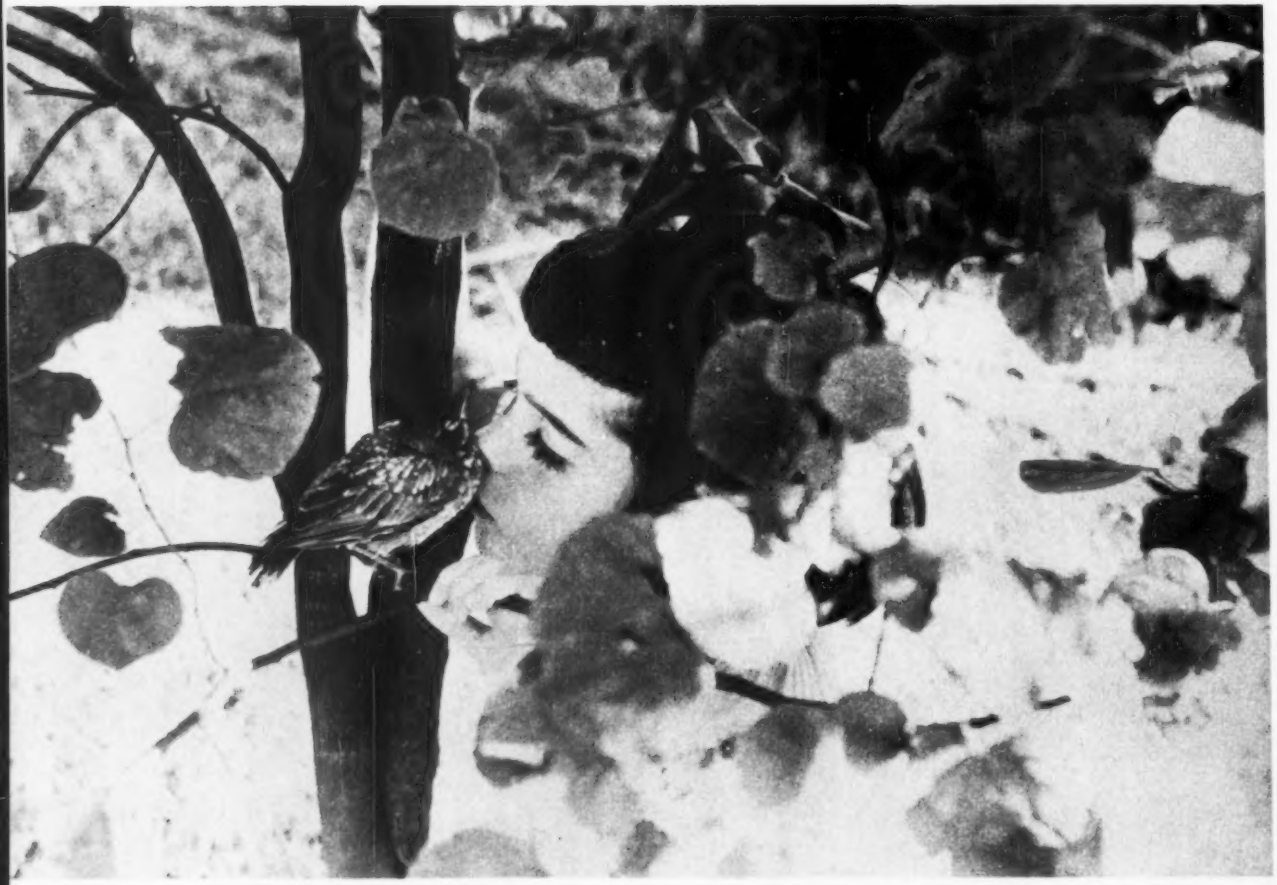
Humorous "stopper" that Swedish photographer Åke Engman made of his son has appeared in the publications of five countries. He took it with a Rolleiflex and 75-mm Tessar *f*/3.5 lens. Exposure was 1/250 sec at *f*/4 on Ilford HP3.

Another commanding close-up, this one of a London actor, was made by Victor Obsatz of New York. He captured the forlorn expression with a Hexacon and 135-mm Triotar *f*/4.5 lens, exposing 1/100 sec at *f*/5.6 with Plus-X film on a cloudy day.



While doing a story on a family with 13 children for International Harvester's *Today*, photojournalist Angus McDougall caught this appealing scene. He used a Nikon S-2 with 35-mm Nikkor *f*/1.8 lens, exposing 1/60 sec at *f*/4 by window light on Tri-X.

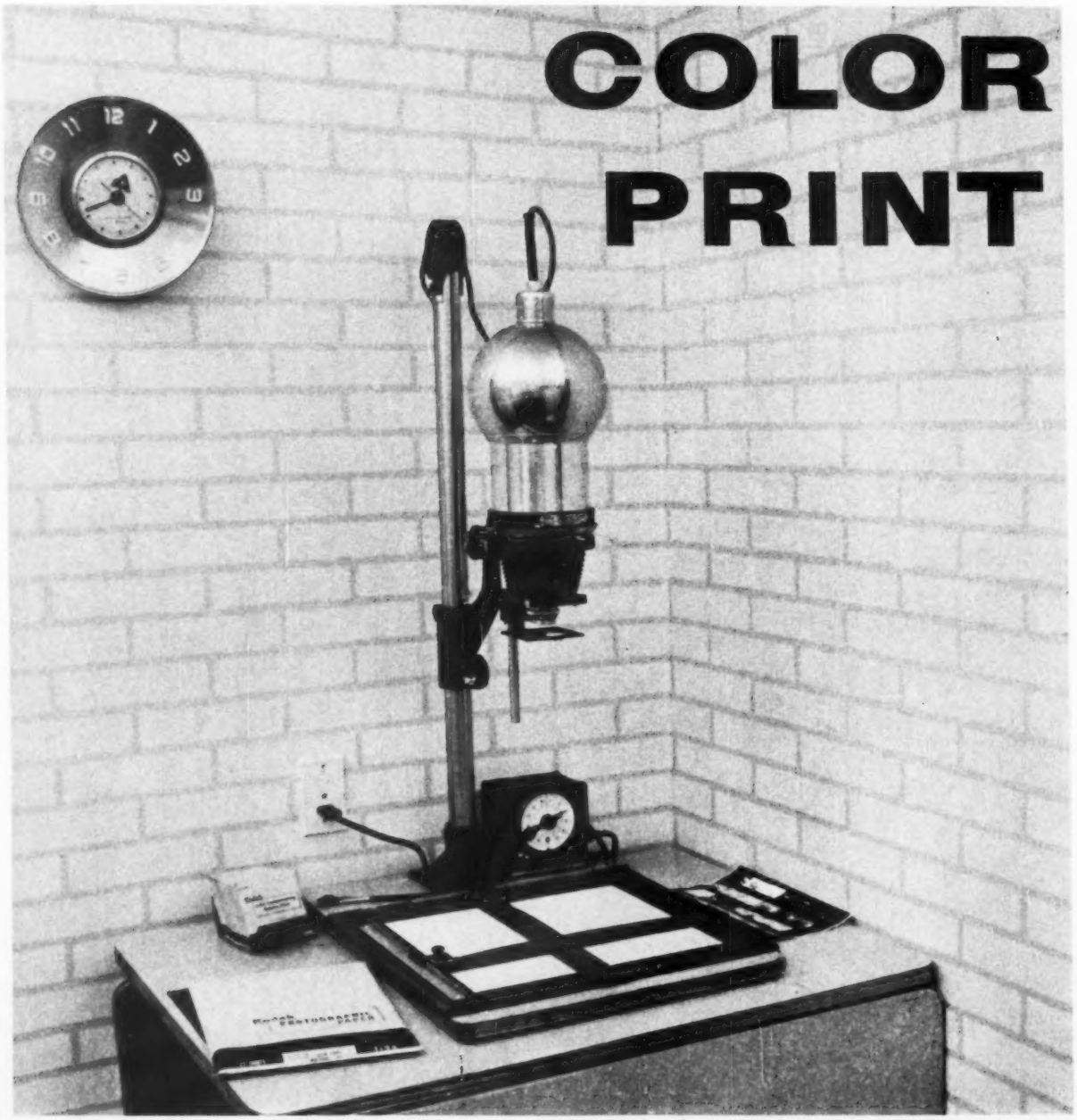
The special joys of childhood are captured in this delicate portrait of his daughter and her pet baby robin by Sol Libsohn of Roosevelt, N. J. His camera was a Leica IIIg with 50-mm Nikkor *f*/1.4 lens; exposure 1/100 sec at *f*/2 on Super-XX.



Spring in Paris, a dog on a canal boat, and young love—the combination was composed into an effective whole by Jeanloup Sieff, a French photojournalist. He made the picture with a Leica M-3, 50-mm Summicron *f*/2 lens, exposing 1/100 sec at *f*/5.6 on Tri-X.

Another spring, but this time in New York's Central Park, where an unexpected snowfall covered the budding willows and boats. *New York Times* staffer Neal Boenzi made the shot on assignment, using a Nikon S-2 with 35-mm Nikkor *f*/2.5 lens, exposing 1/60 sec at *f*/8 on Plus-X.

HOW TO MAKE YOUR FIRST COLOR PRINT

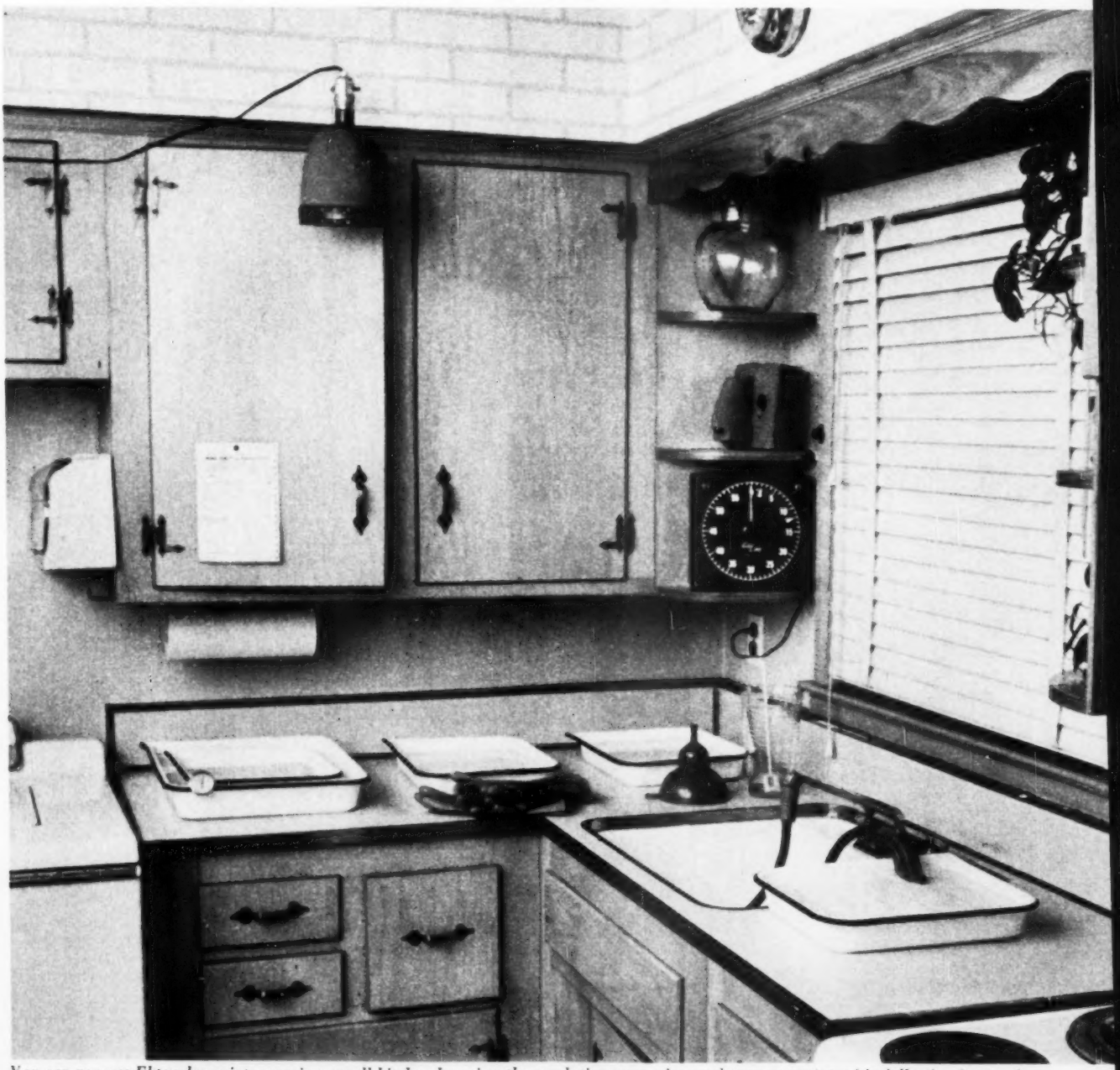


Here's the basic enlarging setup you'll need, similar to what's required for black-and-white: an enlarger, timer, easel plus color filters.

Step-by-step directions for producing prints on Ektacolor (Type C) Paper in your own kitchen

Just how difficult is color printing? Certainly it's more of a job than black-and-white . . . but how much more?

Color printing has traditionally been one of the most difficult of all photo techniques, requiring expensive equipment and great skill. Two and a half years ago Eastman Kodak changed that considerably with the introduction of Type C paper, intended for making high-quality color prints directly from Kodacolor and Ektacolor negatives. For the first time, color prints that rivaled



You can process Ektacolor prints even in a small kitchen by using three solution trays plus wash tray as explained in following instructions.

HERE ARE THE PROCESSING STEPS

Clip and attach to wall

Step Number	Solution	Time (Minutes)
1	DEVELOPER	12
2	STOP BATH	2
3	FIRST FIXING BATH	2
4	WASH (Turn on lights)	2
Optional	If using only three trays, pour back first three solutions, replace with next three.	
5	BLEACH	4
6	WASH	2
7	HARDENER FIXING BATH	2
Optional	If using only three trays, pour back bleach, replace with undiluted Rapid Fixer.	
Optional	RAPID FIXER	1 to 5
8	WASH Rapid Fixer used Rapid Fixer not used	16 8
9	HARDENER	3
10	WASH	2
Optional	If using only three trays, dump wash water, pour out Buffer.	
11	BUFFER	3
12	DRY	

the finest could be turned out in an ordinary black-and-white darkroom, with only a moderate additional investment.

The recent availability of Kodacolor for the first time in 35-mm, plus institution of a new Kodak service producing color slides from these 35-mm negatives, has caused many color photographers—whose most popular tools are the 35-mm camera and Kodachrome—to pause for another interested look at color printing.

(About this same time Type C had its name changed to *Ektacolor Paper*, though the material remains exactly the same. When we refer to Ektacolor Paper hereafter, don't confuse it with Ektacolor film—we mean Type C paper.)

To give a complete picture of just what is involved in making a color print, we converted a typical kitchen into a darkroom for color processing, and followed through the intricacies of making a first print on Ektacolor Paper. The following pages detail a blow-by-blow account of setting up for color printing with a minimum of equipment, including all of the problems you are likely to encounter plus a good many valuable short cuts that will make the job easier. If you are lucky enough to have a more completely equipped darkroom at your disposal, perhaps with space to lay out all seven processing trays at once or even temperature control, so much the better. However, excellent Ektacolor Paper prints can be made with a minimum of difficulty with the equipment listed below.

We began with an amateur's typical existing equipment for black-and-white, then added the necessary color materials to complete the list. The kitchen setup is shown on pages 76 and 77. The enlarger was placed on the kitchen table, as usual. The Formica work surface around the kitchen sink served as a wet area for the trays. The sink was used to rinse processing gear and to furnish the

HERE'S THE EQUIPMENT AND MATERIALS NEEDED

EQUIPMENT

Kodak color filters: A set of 19, if filters are used at enlarger lens; 11, if they are placed in drawer above negative. See text for best size and type for your enlarger. Cost: $15 to $25.

Kodak No. 10 safelight filter

Enlarger: Any tungsten-lamp and some cold-light enlargers can be used.

Timer: A valuable convenience, just as for black-and-white.

Voltage control: May not be necessary if your line voltage is stable, but highly recommended if you plan to do much color printing. Prices range from $20 to $50.

Thermometer: For color, you must have one which reads accurately within half a degree.

Trays: Minimum of three 8x10 trays for processing solutions plus one 11x14 or larger for temperature-controlling water bath around developer tray (unless darkroom sink allows trays to be rested in water bath).

Washer: Rapid change of wash water is required for color. Use 8x10 or 11x14 tray with built-in washer connection, a conventional tray plus a Kodak tray siphon, or a conventional tray with a hose running into it.

Seven 1-gallon bottles

1-gallon mixing graduate or container

Rubber gloves

Funnel

1-qt graduate

Stirring rod

Enlarging easel

SUPPLIES

Kodak Ektacolor Paper: 25-sheet package of 8x10 size, $10.15

Kodak Color Print Processing Kit P-122: 1-gallon size, $8.15.

Kodak P-122 Color Developer: 1 gallon (it's wise to mix an extra gallon since developer is more rapidly used up than are other solutions) $2.98

Kodak Rapid Fixer: 1-gallon size (optional, permits viewing print part-way through processing as it will appear when dry).

WORK AREA

No more space required than for black-and-white. Need running hot and cold water plus mixer faucet and provisions for making room light-tight.

wash water that could be adjusted to the required 75 F.

Since there was no darkroom sink with a water bath to control temperature of the processing solutions, the solutions had to be adjusted to precisely 75 F in the storage bottles, then poured out into the trays at the right temperature just before use. But where to find a container large enough to hold all seven one-gallon bottles in a temperature-controlling water bath? Drastic action had to be taken. We used the bath tub. Your family, however, might not appreciate your preempting the bathroom during a long evening printing session, so we suggest you scout around for a wash tub or other receptacle to hold the bottles.

For the beginner, the entire color printing battle is won when the first *good* color print is produced, for this means that the all-important *basic filter pack* has been determined correctly. This filter pack is made up of the several color filters that must be used in the enlarger's light path to give the print correct, or pleasing color balance. The color filters needed vary widely from negative to negative, enlarger to enlarger, darkroom to darkroom, and between different emulsion batches of Ektacolor paper.

Because of these variables, there is no practical way to predict the filter pack that will be best for the negative you choose to print first, and for your particular setup. It can be determined only through trial and error. Beginning with a filter pack that can be recommended as only a rough starting point, a first test strip will have to be exposed and processed, then a series of test prints until the first good print is obtained.

How long will it take to make the first good print?

As an average for a careful beginner, we estimate that between 4 and 6 test prints will have to be made, exposing and developing them individually, each time evaluating the test print made and deciding on changes in exposure—and much more important—changes in the filter pack that will improve color and density in the next print. Allow one evening for mixing your chemicals, checking your equipment, and reading the manufacturer's instructions. Expect to put in at least one full evening in making your tests and final print. You may need two printing sessions.

Once you arrive at the basic filter pack for your equipment and the specific batch of paper on hand, it is a fairly simple matter to produce good prints from other negatives, or to find a new filter pack for the next batch of paper you buy.

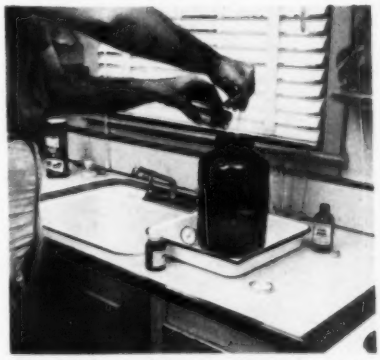
Not only is the first print the hardest, but all difficulties you'll ever encounter in color printing descend on you at once: (1) organizing the darkroom for color processing, and (2) learning correct processing technique; (3) starting off

COLOR FILTERS, PROCESSING KIT ARE HEART OF COLOR PRINTING

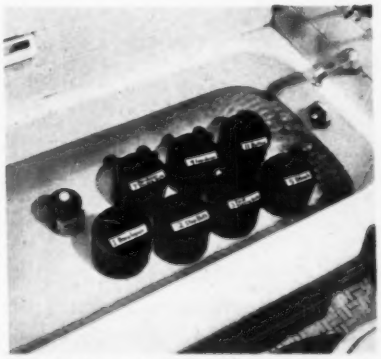
Color filters, squares of unmounted filter material, are packaged in envelopes ideal for storage. Above is complete set of 19 for use under lens, including black metal filter frame.

P-122 Processing Kit, shown opened up into individual components, makes the seven solutions used to process Ektacolor Paper. Warning: avoid skin contact with chemicals.

CAREFUL PREPARATION WILL SAVE YOU TIME AND TROUBLE LATER ON



Mix solutions, following directions exactly. Allow about an hour. Don't get discouraged stirring developer—it's hardest to dissolve. Keep in airtight, clearly labeled bottles.



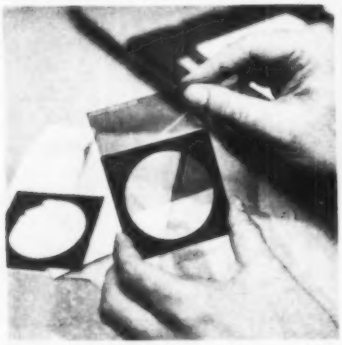
Temperature control. Simplest way to achieve precise 75 F processing temperature is standing bottles for several hours in tub of water at 75 F. Pour into trays just before using.

Change safelight filter. No. 10 filter gives only dim illumination. Do not exceed distance recommendations listed on paper data sheet, because sensitive paper is very easily fogged.

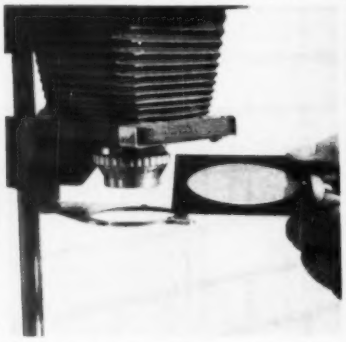
Set up enlarging equipment just as you would for black-and-white. See text for several steps to take to assure best color quality, such as checking condenser lens, shown above.

NOW YOU'RE READY TO EXPOSE A TEST STRIP

Brush dust off Kodacolor negative and place in carrier just as with black-and-white. Handle with care.



Prepare filter pack by sliding gelatin sheets into filter holder. See text for directions on which filters to try first.



Filter pack is placed on enlarger filter holder (first removing red filter) or in a color head if such is provided.

Compose and focus carefully (without filter), then add filter and make test print with 4 stepped exposures.

LIGHTS OUT FOR FIRST THREE PROCESSING STEPS

1

DEVELOPER—12 MIN: Slide print in quickly. Most critical step: temperature (75 F within 1/2 degree) must be exact.

Agitation also affects development, must be consistent. Water in larger tray helps maintain constant temperature.

Drain print for last 20 sec of developing time. Wear rubber gloves to prevent possible skin irritation from solutions.

2

STOP BATH—2 MIN: From here on, temperature need be held only within 2 degrees of 75 F. Image appears very dark.

3

FIRST FIXING BATH—2 MIN: After completing this step, lights can go on. Be careful not to splash any solutions.

from scratch, making test print after test print to find your basic filter pack; (4) immediately encountering the complexities of color filtration; and (5) having to think through a calm, logical evaluation of each print's color balance and density before making the next.

These problems all lumped together sound quite frightening and perhaps even insurmountable. Actually, they are not. The amateur capable of making good black-and-white prints and serious enough about color to put in the necessary few evenings of hard work and thought can surely learn to make good color prints. (This is deep water for the man who does not already know his way around the darkroom though, and we definitely advise him against tackling color printing without the help of someone who is at least familiar with black-and-white work.)

The biggest stumbling block to the color beginner is the actual judging of color—knowing what end result is desired and being able to tell just what colors are in excess or are lacking in a test print. Kodak literature contains several excellent beginning explanations of color and color filtration (reading them is a must), but to help you as much as possible in judging your first Ektacolor Paper prints, we have prepared a very basic *Color Filtration Technical Supplement* (see table of contents for page number).

CHOOSING THE FIRST NEGATIVE

Efficient color printing relies on a *master control negative*, and a basic filter pack determined from that negative. Unless you don't mind repeating the long hours spent in making your first good print, your first negative should serve as your master control negative for future work.

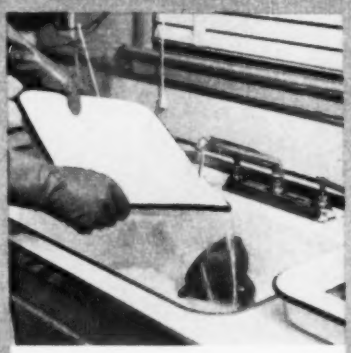
It must be of top-notch quality, properly exposed and processed, and balanced to one of the types of illumination standard for color negatives: daylight or clear flash for roll film; 3200 K tungsten or clear flash for sheet film. Select the lighting condition you'll be printing most often. If you usually shoot 35-mm outdoors, for example, then a 35-mm Kodacolor taken under ideal sunlight condition is best. Exposure of color negatives is rather continued on page 108

AFTER FIRST WASH, SET UP NEXT THREE SOLUTIONS

4

WASH—2 MIN: Be sure water is at proper temperature and circulating freely before adding print.

After print is washed, pour first three solutions back into their bottles and replace in tub for use next time.



Thoroughly rinse funnel after each solution is poured, and rinse trays before adding new solution. This is important.

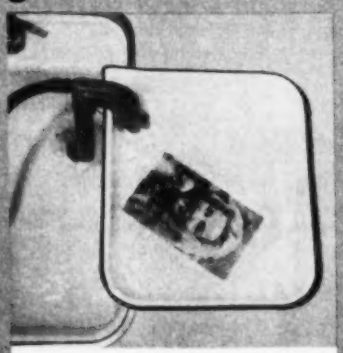
Refill clean trays with next three solutions: bleach, hardener fixing bath, and hardener (see chart).

NOW CONTINUE WITH YOUR PROCESSING

5

BLEACH—4 MIN: At this point image grows lighter. Be especially careful not to spill any bleach.

6



WASH—2 MIN: Keep thermometer handy to frequently check temperature of various solutions.

7

HARDENER FIXING BATH—2 MIN: At this point you can prepare for an optional but very useful extra step.

Pour bleach back into bottle, rinse tray thoroughly, and refill with full-strength Kodak Rapid Fixer.

continued

EVALUATE PRINT IN RAPID FIXER, THEN COMPLETE PROCESSING

RAPID FIXER—1-5 MIN: Optional step clears print, permits evaluation of color before dry.

8

WASH—16 MIN: 8 min if Rapid Fixer not used. Time can be put to good use figuring correction for next print.

9

HARDENER—3 MIN: Don't confuse First Fixing Bath, Hardener Fixing Bath, and Hardener. Best to number bottles.

10

WASH—2 MIN: Process test prints to completion even though you've previewed print in Rapid Fix.

When wash is completed, remove print from tray, dump wash water, rinse tray, pour buffer in.

11

BUFFER—3 MIN: This is last bath. Processing takes just about an hour as described here, plus drying time.

12

DRY. Before setting out to dry, gently wipe front and back of print with a clean towel to remove excess liquid.

Simplest drying method is to place print on clean surface, allowing nothing to touch face of the print.

YOU'VE MADE A COLOR TEST STRIP, NOW IT'S TIME TO BEGIN PRINTING IN EARNEST. A FEW MORE TRIALS WILL BE NECESSARY, IMPROVING COLOR GRADUALLY, TO REACH A FINAL GOOD-QUALITY PRINT . . .

. . . A TYPICAL SERIES OF TEST PRINTS

IS REPRODUCED ON THIS AND FOLLOWING PAGES

Top negative in Kodacolor strip was chosen for its good exposure, typical outdoor illumination, and large, well-lighted face. Small prints next to negatives are a portion of an 8 x 10 color contact proof sheet made by lab that processed film, afforded a valuable preview of the picture. Test strip at right shows exposure times of 5, 10, 20, 40 seconds.

35-mm Kodacolor negatives

Contact prints

Test strip on Ektacolor Paper

HERE ARE TEST PRINTS IN THE ORDER MADE

1 Filter pack: 2B + 50R
Exposure time: 10 sec

2 Filter pack: 2B + 30R
Exposure time: 6 sec

3 Filter pack: 2B + 50R + 10R
Exposure time: 13 sec

4 Filter pack: 2B + 30R + 20M
Exposure time: 9 sec

5 Filter pack: 2B + 30R + 10M
Exposure time: 9 sec

6 Filter pack: 2B + 25R + 15M
Exposure time: 7 sec

Here's how a beginner might proceed in making his first series of test prints. The filter methods used are detailed in the *Color Filtration Technical Supplement* in this issue. Study it before you attempt this.

1 BEGINNING FILTER PACK. For comparison with other prints, this one was made with best test strip exposure and beginning 2B + 50R filter pack. Evaluation: Print is too cold . . . too blue? Seems slightly green also. Since combination of blue and green is cyan, perhaps there's too much cyan. Chart in Technical Supplement lists "subtract 20R" as correction for "more than slightly too much cyan." For next print 50R in filter pack must be changed to 30R. Change in filtration also affects exposure, with new exposure time simply calculated from table in Technical Supplement.

2 SECOND PRINT is obviously too red. "A lot of red" in filter chart calls for "add 30R." Old filter pack of 30R plus new 30R totals 60R. There's no 60R filter, so we must combine 50R and 10R as filter pack for next print. New exposure figures out to be 13 sec.

3 THIRD PRINT. Pretty disappointing. Three prints made so far have shifted back and forth between cyan and red. We can now tell from the prints that the correction we want does not lie along the red—cyan color axis. Careful study shows that first print is not too cyan but too blue. Our second and third attempts are so far off it's best to go back to the beginning filter pack. For "more than slightly too blue," filter chart lists "subtract 20Y." A little paperwork comes up with a new filter pack of 30R + 20M, exposure time of 9 sec.

4 FOURTH PRINT. We're on the right track. Blue has been reduced, and now there is just a little too much green. Consult chart for "slight too green." "Subtract 10M" is listed, making new filter pack 30R + 10M.

5 FIFTH PRINT. Color looks good here. Need perhaps just slightly more yellow (indicating we took away too much yellow in print above). Print is dark because we forgot to refigure exposure when filter pack was changed. To add a touch of yellow we refer to "very slight too blue" column, which says "subtract 05Y." New filter pack is 25R + 15M, new exposure time 7 sec.

6 SIXTH PRINT. This is it. Slightly lighter would be more pleasing though, so cut exposure time from 7 sec down to 6 sec.

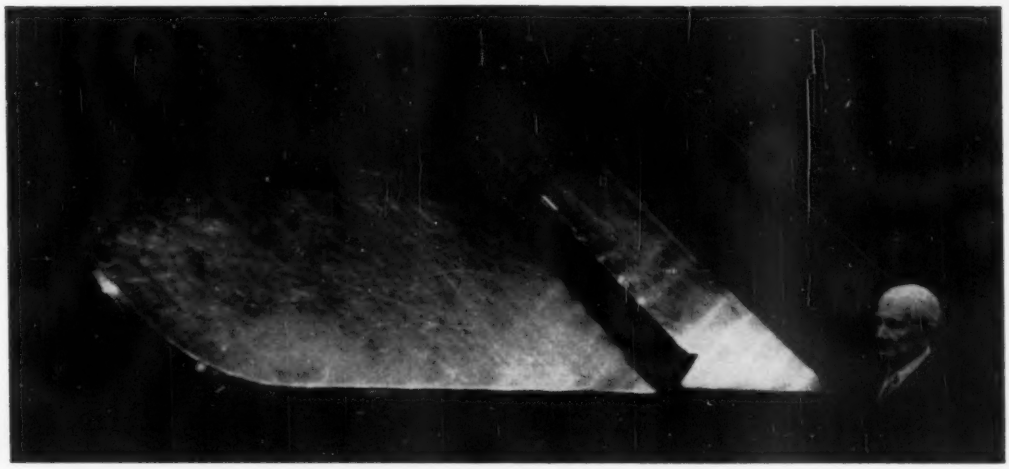
FINAL PRINT is shown on page opposite, printed with same filter pack as sixth test print

AMATEUR'S

1 *Martin J. Schmidt*

2 *John P. Nuger*

WORKSHOP*



The editors of POPULAR PHOTOGRAPHY will discuss pictures submitted by readers. We will pay $15 for each black-and-white and $25 for each color photograph published. Only color will be returned. Complete technical data must accompany all pictures.

3 *Vytas Valaitis*

*LET'S TALK ABOUT YOUR PICTURES

1 Martin J. Schmidt, Chicago, Ill. An old railroad station in Tombstone, Ariz., split the editors, but all agreed it gave off an air of desolation and nostalgia that clearly said "ghost town." The majority liked the horizontal composition with the eye directed to the station by the crossing sign, rails, and switch marker. Leica IIIf with 35-mm Summaron *f*/3.5 lens, exposed 1/60 at *f*/8 on Kodachrome.

2 John P. Nuger, Des Moines, Iowa. This Coney Island concession drew almost unanimous praise for the bizarre subject matter so humorously sinister. One editor disliked the dead-center, straight-on shooting angle, feeling that the compelling colors failed to save the picture from the ordinary. Leica M-3 with 50-mm Summicron *f*/2 lens, exposed 1/50 at *f*/2.8 on Super Anscochrome Tungsten rated at 200.

3 Vytas Valaitis, Cicero, Ill. The editors liked this strong composition and sharp contrast between the spotlighted artist and piano top and totally black background. But all felt the technique could have been improved upon, with more over-all sharpness and better printing for stronger blacks and whites. Rolleiflex with 80-mm Xenotar *f*/2.8 lens, exposed 1/60 at *f*/4 on Tri-X.

4 *Rodger L. La Pelle*

4 Rodger L. La Pelle, Philadelphia, Pa. An effective close-up that needs no caption drew nods of approval for its spontaneity and fun-qualities. All editors felt that the blurred hand contributed motion and combined with a perfect expression. Two editors disliked the out-of-focus chin, however. Rolleicord IIA with 75-mm Xenar *f*/3.5 lens, exposed 1/50 sec at *f*/5.6 on Super XX in open shade.

RATE YOUR CAMERA continued from page 51

Here are comments on the questions, to help you evaluate your present equipment realistically, and to suggest ways to bring it up to date.

Is it difficult to operate your camera quickly?

If you find yourself missing good pictures because of slow camera operation, first check your own technique. Practice "dry runs" without film until you can operate your camera quickly and without fumbling. If focusing and viewing are a problem you might consider a newer model with large, bright-line finder. Perhaps the camera type you are using is not the best for you. For example, some people with eyeglasses prefer a twin-lens reflex with waist-level groundglass viewfinding to a 35-mm with an eye-level optical finder. Others might prefer a prism reflex type, or a press camera, perhaps. Old-fashioned film-advance systems may be slowing you up, too. Most modern 35-mm cameras are equipped with levers that advance the film with one or two quick strokes, and many roll-film cameras today replace the ancient "watch-the-window" system with some kind of automatic film stop and double-exposure prevention.

Do you have trouble seeing through your viewfinder?

Check to see that your viewfinding system is absolutely clean. In a 35-mm model, clean both the rear and the front windows with a camel's hair brush (to remove dust) and lens tissue (to remove grease spots). With a reflex camera, blow off the groundglass with a rubber syringe, then wipe carefully with lens tissue.

Adding a Fresnel lens to the groundglass of a reflex camera will brighten the viewing image at the corners. Sportsfinders in a variety of styles—open frame, wire, and optical—are available for twin-lens reflex and press-type cameras. They will improve your ability to follow fast action. With many models of 35-mm cameras, an accessory clip-on viewfinder is required when using wide-angle and/or long-focus lenses, and is also useful for available-light photography in dim light even with a normal lens, giving a brighter image than the built-in finder. A focusing hood with or without a magnifying eyepiece can help you viewfind and focus your twin-lens reflex camera more precisely and easily.

Are you getting out-of-focus pictures?

Again, check your technique and be sure it's not you that's at fault. If, in spite of careful focusing, you are getting too many fuzzy, out-of-focus pictures, you'd better check your camera's mechanical and optical system carefully. First check the rangefinder, if the camera is so equipped. Focus sharply at a distant object and then see if the distance scale is lined up at the infinity mark. Then measure off a medium distance, focus the camera at this known distance, and see how close the rangefinder comes. Repeat at a short distance. Also check to be sure the lens and lens mount is tight. If the camera's focusing system is out of whack, or the lens is loose, best take it to a qualified camera repairman for an overhaul.

Of course, if your camera doesn't have a rangefinder, and you've been guess-focusing, you might consider replacing it with a model that does provide a focusing system. Some people prefer a split-image or superimposed-image optical rangefinder, others prefer the groundglass viewing of a twin- or single-lens reflex. Only you can make the choice as to which is best for your working methods. By all means actually make pictures with the type you intend to buy before coming to a final decision.

Are you missing pictures because subject matter is too far away?

Obvious solution, of course, is to try to get physically closer. If you can't then the solution is a long-focus lens. All press-type cameras, many 35-mm cameras (both prism and rangefinder types), and one twin-lens reflex model offer lens interchangeability. How long a telephoto you need depends on what you intend to use it for. With a 35-mm outfit, for example, an 85-mm long-focus lens is excellent for portraits, filling the frame with an image of the head while allowing you to stand far enough away from the subject to minimize perspective distortion. For sports and action subjects you might need a 135-mm. For nature subjects a super telephoto of 300-, 400-mm or longer may be required.

Are you missing pictures because subjects are too large or too wide?

If this is a frequent problem for you, then you need a wide-angle lens. Interestingly enough, some noninterchangeable 35-mm cameras are now appearing with a semi-wide-angle 35-mm lens as the standard lens. Many pros prefer the increased coverage and depth of field provided by the shorter focal length to the "normal" 50-mm lenses long considered standard. If your 35-mm camera accepts interchangeable lenses, you can get 28-, 25-, and 21-mm super-wide-angle optics as well as the semi-wide-angle 35-mm. With such lenses you can cover a wide area even when working close to the subject in cramped quarters. Wide-angle lenses are also available for press-type cameras and one roll film reflex.

Have your camera's limitations kept you away from the close-up world?

They shouldn't. Even a nonfocusing box camera will take close-ups with the aid of supplementary lenses placed in front of the regular lens. However, if you plan to do considerable close-up work, consider the convenience of single-lens reflex design or a reflex focusing attachment for rangefinder cameras. In either case you'll also need extension tubes or bellows to increase the lens-to-film distance for extreme close-ups. With such extension devices and reflex viewing you can see exactly what you're getting, focus accurately, not have to worry about parallax (the discrepancy between what the viewfinder shows and what the film records, always greater at close-up distances). Press-type cameras, too, with groundglass backs and interchangeable lens boards, are easily converted for extreme close-up work.

Do you have trouble shooting pictures unobtrusively?

The trouble may be psychological (some people are just too timid to shoot candid pictures) but your choice and use of camera can help. Perhaps your camera is too large and attention-getting. The solution might be to switch to smaller equipment—35-mm or a tiny subminiature—which can be carried in a pocket and concealed in your hand. The use of a long lens can help too, by allowing you to get a larger image from a greater distance. With a twin-lens reflex you can try "shooting around the corner;" that is, hold the camera with the lens pointed at a right angle to your body while you pretend to shoot straight ahead. A black anodized body is available for some models of 35-mm equipment, to cut down reflections and make the camera less obtrusive. Or you might simply paint the shiny chrome on your camera with black lacquer to achieve a similar effect.

Is your lens too slow for available-light shooting?

Even an *f*/3.5 or *f*/4 lens at *f*1/25 second is fast enough to handle many available-light situations with today's superfast films. Choose one of these ultra-high-speed emulsions and learn to hold the camera steady at relatively slow shutter speeds. By adopting modern processing methods you can safely expose such films at an exposure index of up to 800 and more (for ASA-calibrated meters) with good results. (See *High-Speed Films*, elsewhere in this issue, for details.)

If you still don't have adequate speed, consider buying a camera with a faster lens or adding a fast lens to your old box. Many 35-mm cameras in the medium-price class come equipped with excellent *f*/2 and *f*/1.9 lenses, which should be fast enough for most purposes. A variety of *f*1/4 lenses are available for interchangeable-lens 35-mm equipment, and optics as fast as *f*/1.1 can be purchased by those who need the last possible fraction of speed they can obtain.

Is action blurred even at your fastest shutter speed?

Again, improving your own technique sometimes can eliminate the problem. Avoid shooting action at close range, learn to catch "peak action" when the motion is more easily stopped, practice panning your camera in the same direction as a fast-moving car or running person, and shoot approaching objects from head on or a 45-degree angle rather than straight across your camera's line of sight. When shooting action, use a fast

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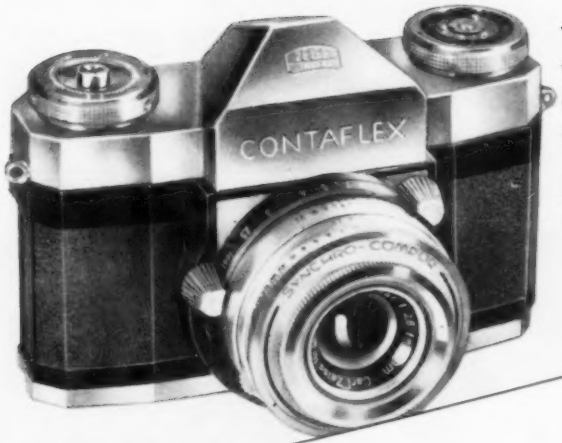

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If you still get action blur, you need a camera with a faster top shutter speed. Fastest shutters available today are the focal-plane variety, with speeds of up to 1/1000 second, available on high-quality 35-mm equipment and in advanced models of press cameras. Leaf-type shutters on much medium-priced equipment today goes up to about 1/500 second.

Do you cut off the tops of heads even though you frame carefully?

Your enemy is that old demon, parallax, mentioned before. Trouble arises because the viewfinder lens or window is located about and/or to one side of the taking lens with a result that what you see and what the film gets are not exactly the same. This discrepancy increases at close distances. Most viewfinders include guide lines for correcting parallax at close distances. Some of the more advanced 35-mm rangefinder models offer automatic parallax correction. If you do a lot of close-up work, where parallax is a frequent problem, you might want to settle on a single-lens reflex camera or a press or view camera with a groundglass back, both of which eliminate the problem by letting you actually see through the taking lens itself.

Does action "run out of your picture?"

A galloping horse goes by. You click the shutter and assume you have a picture, but when you see the film you find you only have half the horse. The action moved out of your viewfinder before you realized it. Perhaps your panning technique could be improved: learn to swing your camera in perfect synchronization with the action, and "follow-through" even after you've made the exposure.

If you're still missing action, perhaps you need a larger, brighter supplementary viewfinder, or an open sportsfinder.

Do you miss pictures because you can't wind film fast enough?

Practice "dry runs" can increase your speed here. If you're still not satisfied, and your camera is an old-fashioned turn-the-knob-and-watch-the-window type, perhaps you should invest in more modern, convenient equipment—a 35-mm with single-stroke rapid-film advance, or a roll-film camera with automatic or semi-automatic film-transport features.

Do you have difficulty loading your camera?

Are you missing good pictures because you always seem to be fumbling with a new load when the action happens? Again, your own technique may be at fault. Practice with a spare roll, standardizing your procedure. Keep at it until you can do it in the dark or with your eyes shut. A rapid rewind crank, offered as a built-in feature or as an accessory for some 35-mm cameras, will help speed up your operation. With a press-type camera, use film pack rather than holders with sheet film if you're going to shoot several shots quickly.

Is it inconvenient for you to change from black-and-white to color?

The use of two cameras—one loaded with color, the other with black-and-white, is perhaps the best solution. Otherwise, you might choose one of the cameras available with interchangeable backs. With 35-mm you can note the exposure, rewind the partly exposed roll, and replace with another roll. The partly exposed film can be used at a later time, after you've run it through the camera again until you reach unexposed frames. For details on these and other methods, see *How To Switch Film in Mid-Roll*, elsewhere in this issue.

Do you fail to get enough pictures in a situation?

If you find yourself constantly running out of film at the wrong time, remember to keep your pockets or gadget bag stocked with an adequate supply of additional rolls. And if you naturally find yourself burning up an 8- or 12-exposure roll film too quickly, perhaps your tempo of shooting is geared more closely to 35-mm with its 20- and 36-exposure casettes. A roll-film adapter for a press-type camera and a 35-mm adapter for many types of twin-lens reflex cameras can increase your exposures per loads for special situations.

Do you miss pictures you might have made with flash or speedlight?

Today almost every camera is internally flash synchronized. All you need to do to increase your camera's scope, in most cases, is to add an inexpensive flash unit which plugs into the synchronizing contact on the shutter. Older model cameras usually can be synchronized for flash by a camera repairman.

Do you find carrying an exposure meter a nuisance?

If so, investigate the many new models of cameras featuring built-in meters. In some cases the meter is coupled to the shutter, allowing semi-automatic exposure calculation. You just set the meter, point its cell at the subject, and line up two markers on the meter dial. When the markers line up, the proper exposure is set. Also, extremely compact meters are available today which clip onto the accessory shoe on top of many cameras. Thus you can enjoy the convenience of a meter on the camera, but can remove it for greater freedom and flexibility when taking a reading.

Do you leave your camera at home because it's inconvenient to carry?

A well-designed gadget bag will help you solve this problem, and so will a neck strap of the proper length. Try carrying your camera with the strap over one shoulder *under your coat*—this keeps the camera ready for action but avoids the unpleasant bumping against your chest that often arises when the camera is slung around your neck in the conventional way. Of course, another solution is to switch to more compact, lightweight equipment when you travel.—

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Copy Your Color Slides continued from page 60

useful as it crops out ¼ the area of a 35-mm slide. (Area seen by the camera is 13.5 x 19.5 mm.)

Making a setup

The pictures on page 61 show how all these units fit the cameras for which they were intended. Also shown are some suggested camera, copying device, and lighting setups.

You will note that in the latter, a copying stand is shown. This may be one purchased especially for the occasion or it may be an enlarger stand minus the enlarger head. A good substitute (to hold either the camera or an electronic flash unit) is an elevating-type tripod.

Choice of film and illumination

A combination of daylight type color film and electronic flash is best for making duplicates by amateurs. Electronic flash is cool, constant in light output, and when used with daylight film gives the least amount of contrast increase or color shift. Also, due to the speed of the flash, there is no danger of blurring caused by vibration of equipment. For the most constant light output, a-c, rather than battery operation, is recommended. In situations where the image must be focused on a groundglass (or if you wish to see a preview) substitute an ordinary 100-watt tungsten lamp for viewing. Replace with the flash unit before making the picture.

You may also use daylight with color film. Colorwise, this system is not as reliable since the color quality of daylight varies considerably with time of day, invisible ultraviolet content, etc. Using daylight for your illumination, you simply point the unit directly at the sun. If the unit does not have its own diffusion disk, place on opal glass between the slide and the sun. To prevent excess blue rendition from invisible ultraviolet rays, use a Skylight filter, even when other filters are also utilized.

It is also possible to use photofloods and 3200 K lamps with Tungsten Type A and Type F color films. When using these light sources it is important to use lamps for no more than half their rated life (color temperature changes with age of lamp). Line voltage is also important. For consistent results, a voltage regulator (such as General Radio Corp.'s Variac or Industrial Timer Corp.'s Monitor) should be used. It's important to be wary of excessive heat reaching your transparency. For these reasons, the amateur would be wise to work with daylight film and electronic flash.

If you do use tungsten light sources, follow these film-light-filter combinations:

FILM	LIGHT SOURCE	FILTER
Ektachrome Type F	Photoflood	82A
Kodachrome Type F	3200 K lamp	82C
Kodachrome Type A	Photoflood	none
	3200 K lamp	82A
Super Anscochrome, Tungsten Type	Photoflood	81A
	3200 K lamp	none

Exposure

Because of the multiplicity of units on the market, each with its own merits, the differences in slide densities, and the user's personal taste, it is impossible to publish more than suggested starting points from which to determine your own correct exposure.

Try the following exposures using a small 50- to 75-watt-second electronic flash unit:

For Accura Model IL Duplicator, Belun, Contakop, and Voigtlander Macro units set for 1:1 copies and using Anscochrome or Ektachrome, try placing the unit at least 12 inches from the slide; with Kodachrome, at least 8 inches. Diffuse your light with opal glass.

For the Testrite Cinelarger, the flash unit must be placed at 2 or 3 inches from the slide with Anscochrome or Ektachrome. If this is not possible, try our test of a sunlight exposure of about 10 or 15 seconds. (Exposures for other light sources and film combinations come with the Cinelarger. You'll find these exposures conservative. Our experience shows that about a half shorter exposure works better in many cases.)

For Accura Slide Duplicators Model 44 and 50, place the electronic flash unit at about 8 in. away for Ektachrome and Anscochrome, and at 6 in. for Kodachrome.

To make black-and-white negatives from color slides with the above units, use the same settings as for Ektachrome and Anscochrome with a medium-speed (ASA 40-50) black-and-white film. Short development—about 20 percent less than normal—will be found useful by keeping the contrast down.

If your duplicates tend to be consistently light, move the light further away. If they are too dark, move the light closer.

For your first test, choose a slide of average density having pastel as well as rich colors, and make a number of exposures with the light at various distances. Moving the light, rather than varying the diaphragm opening, is recommended since it is best to stop down as much as possible for maximum sharpness with these copying devices. For really dense original slides, you can move the unit closer and for the pale ones, farther away.

Effect of film choice on result

Kodachrome, the contrastiest of the color film, is not recommended for general copying since contrast mounts too much, tending to block shadows and wash out highlights. However, it is an excellent choice for duplication if your original is flat and weak, and your duplicates could stand some extra contrast.

Ektachrome may be used for general duplicating as it is less contrasty than Kodachrome. It is not recommended for use with extra-contrasty slides.

Anscochrome is the least contrasty color film and should be chosen if your originals are contrasty (deep shadows and brilliant highlights). Its use is recommended for all but really flat slides.

Super Anscochrome yields duplicates similar to Anscochrome. However, unless the working distances given for the electronic flash units in the exposure guide (above) are far too great to give full exposure, the use of this film with its higher price presents no special advantage in duplicating. A possible use for Super Anscochrome is in the duping of extremely dark originals.

No specific statements can be made on rendition of colors you can expect from the various color films. Much will depend on whether you are duping Anscochrome on Ektachrome, Ektachrome on Kodachrome, etc. Processing can also affect color rendition.

In general, Anscochrome produces true

SLIDE COPYING DEVICES

Accura Slide Duplicator Model IL—fits cameras with interchangeable lenses, comes in 3 models: KE for Exakta-type bayonet mounts; LE for Canon- or Leica-type threads (adapter needed for Leica M-3); CS for Contax D, Pentacon, Consol, Praktica, Edixa Reflex, Asahi Pentax, and cameras with similar threads. Price, $39.95.

Accura Slide Duplicator Model 44—fits cameras with non-interchangeable lenses (via a Series 6 filter adapter ring) but can be used where it is difficult or undesirable to remove an interchangeable lens. It makes same size duplicates when used with 35-mm cameras having 43-, 44-, or 45-mm lenses. When used with 2¼x2¼ or press-type cameras, it offers enlarged duplicates. Price, $24.95.

Accura Slide Duplicator Model 50—For use with 48-, 50-, 55-, and 58-mm focal-length lenses; otherwise, same as above.

Leitz Belun—fits cameras with Leica-type interchangeable-lens threads. Models available accommodating Leitz Summar and Elmar f/3.5 lenses. Unit uses camera's 50-mm lens and a fixed extension tube. Price, $12.

Testrite Cinelarger—copying unit which operates independently of camera, makes enlarged copies on 620 rollfilm, has own lens and time-exposure shutter. Duplicate or negative size about 2x3-in., depending on mount. Price, $22.95.

Voigtlander Prominent Macro—has its own lens and uses the Prominent 50-mm lens as a supplementary. Magnification ratio is 2:1, useful for cropping slides. Price, $139.

Zeiss Contakop—fits Contax-type bayonet lens mount cameras, uses any 50-mm lens. Price, $37.

yellows, tends to make blues somewhat violet-blue, renders greens yellowish, and reds toward magenta. Ektachrome renders yellows a bit on the orange side, reds toward orange, and blues toward blue-green. Kodachrome gives similar, but colder, results as Ektachrome.

Effect of development

When Ektachrome and Anscochrome films are exposed at higher than normal ratings and force-developed, contrastier results are had. You can use this to your advantage to get extra snap in your dupes. A custom color finisher or the custom department of a color processor can "push" your film for you—or you can process it at home. Exposing Anscochrome and Ektachrome at lower than normal ratings results in less contrast and greater exposure latitude when developed properly.

Want special color-processing instructions? Send a self-addressed, stamped envelope to Otto Bayer, c/o POPULAR PHOTOGRAPHY, *One Park Ave., N. Y. C. 16.*—

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For each picture selected to run with the one by Suzanne Szasz, we will pay $25. All prints—preferably 8x10 glossy black-and-whites—must be marked clearly on their reverse side with your name, address, and any pertinent technical data.

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High-Speed-Film Roundup

continued from page 55

12 minutes, or 25 percent less than the recommended development time. *(Today, the official D-76 recommendation for small-tank development with intermittent agitation at 68° F is 11 minutes.)* More than this, however, photographers who knew that the use of higher-than-recommended film-speed indexes with the pre-1954 crop of films entailed some loss of quality in terms of thinner shadow densities when development was not forced, and increased contrast and grain when it was, soon found that with the new high-speed films advanced film-speed ratings were no longer merely something one could get away with, but an absolute necessity. For, while the new films were very much faster, their grain-density ratios were surprisingly higher, and the use of extremely high effective speed ratings (as compared to the film makers' published ASA indexes) became not merely a means of obtaining higher shutter speeds and/or smaller lens openings, but a virtual necessity for the preservation of grain, gradation, and sharpness. More about this later, but for the moment suffice it to say that with these new super-speed materials forced development became obsolete (except as a purely remedial technique for dealing with accidentally underexposed negatives) and, with normal or less-than-normal development, multiplication of the published speed indexes ceased to be a means of obtaining increased speed at the expense of reduced quality, becoming instead a means of improving negative quality in which increased speed was a gratuitous by-product.

The second 1954 event which had a profound, though indirect, effect on available-light photography came about as the result of the dissatisfaction on the part of the U. S. importers of the Leica camera with the quality obtainable from then-existing films in this country. To give their lenses something sharper and finer grained with which to work, E. Leitz, New York, began importing and distributing two European thin-emulsion films, Adox KB-14 and KB-17. These inherently slow materials (KB-14 was then rated at 16, KB-17 at 32) opened many eyes to standards of 35-mm sharpness and incredibly fine grain that had previously been regarded as the exclusive province of the large-format camera. Before the year was out, Eastman Kodak responded to this challenge by introducing their new 35-mm and roll-film thin-emulsion material, Panatomic-X. And, in the next 18 months these were joined by a host of additional European thin-emulsion films.

Speak only of grain

The photographically eventful year of 1954 thus presented the American photographer with two new families of films, one which extended his ability to cope with dimly illuminated available-light situations; the other which tremendously increased his ability to produce negatives so sharp, and so very near to grainlessness, that even large-diameter enlargements compared very favorably with the standards set by larger negative formats. These thin films became, in a very real sense, the conscience of 35-mm and small-format roll-film photography. Before their introduction photographers spoke of "objectionable" and "unobjectionable grain." Afterwards they spoke only of grain.

With optimum quality standards being set by high-acutance ultrafine-grain thin-emulsion films *(whose characteristics are being closely approximated in a number of medium-speed materials such as Ilford's FP3 and Kodak's newly improved Plus-X emulsion)*, the high-speed film today faces stiffer competition, and sterner criticism than at any time in the past. What these super-speed films have to offer can be enumerated in a single word: speed. How we can best exploit this speed requires a bit more telling.

Emulsion Speed: The sensitometrist who designs a film, and supervises its intricate manufacture, defines emulsion speed in a complicated, but necessarily scientific manner as a value "inversely proportional to the minimum exposure which must be incident upon the negative material, from the scene element of minimum brightness in which detail is visible, in order that a print of excellent quality can be made from the resultant negative," according to the official ASA standard. This speed value is obtained by means of an involved sensitometric method, and never published. What is published is an ASA *exposure index*, and this index is obtained, simply enough, by merely dividing the speed value by four!

This is done for a number of papa-knows-best reasons, the most important of which are the broadening of the exposure latitude *(by redistributing the range of allegedly permissable exposure errors so that the index lies approximately midway between the two extremes of over- and underexposure)* and the incorporation of an anti-underexposure safety factor *(to guard against the vagaries of our equipment and our heads)*. The result is, of course, the recommendation of an exposure level far in excess of the true speed point of the film. And, since this speed point is, in plain English, the least amount of exposure required to obtain the maximum amount of quality, what the published indexes really call for is approximately four times more exposure than is actually needed.

The first step in developing an exposure technique with any one of the modern high-speed films is the elimination of all or most of this dubious safety factor. This can be done most expeditiously by multiplying the film's ASA speed rating by a factor of anywhere from a minimum of about 2.5x to a maximum of 5x. In so doing you have taken the first step toward the elimination of the most serious problem encountered in high-speed film work: overexposure.

The horrors of overexposure

Grain, Gradation, and Sharpness: Of all the types of b-&-w film available today, high-speed materials have the greatest amount of grain, the poorest gradation,

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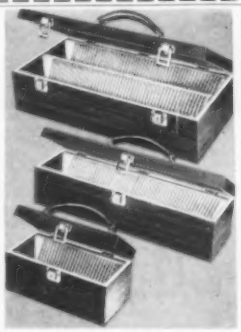

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and the least sharpness. Overexposure is the easiest method available for making this grain even worse, further reducing the available gradation, and undermining sharpness. And, not only can these effects be obtained by overexposure alone, but given enough overexposure, no manipulation in development will be of any value whatever.

Although high-speed films differ in their inherent contrast and gradation characteristics, all are basically *flat* materials offering markedly less tonal separation (especially within the shadow and middle-tone areas) than other films. The first effect of overexposure is to further reduce these capabilities by building proportionately more density within the less well illuminated areas of the negative than within the highlights. The result is lower over-all contrast and muddied-up middle-tone and shadow areas. With excessive density comes added grain. This is true of all films, but especially true of the high-speed materials which have the highest density-to-grain ratios available, and the production of added grain through overexposure is as undesirable as it is unnecessary. Finally, excessive exposure undermines the high-speed film's sharpness potential by encouraging the process of irradiation. This is the random exposure of light-sensitive particles within the thick emulsion layer which had not previously been affected by light rays coming from the lens. By making this non-image-forming silver developable along with image-forming silver, these light rays bouncing about within the emulsion effectively undermine image sharpness, blurring the outlines of optically cast images and causing them to merge muddily with their backgrounds.

Effective Film-Speed Indexes: The high-speed films listed in the chart on page 54 should be divided into two groups: Kodak's improbably fast Royal-X pan, and the other seven. These seven films have ASA ratings ranging from a high of 400/320 to a low of 200/160. Actually, however, they all give their best performances at approximately equal effective film-speed ratings with normal development. For four of the seven, this optimum rating appears to be approximately 650-800 (for ASA-calibrated exposure meters). Two are just slightly faster (about a half-stop or so) and give their best results with 800-1,000 ratings, while one — Afga's Isopan Ultra — is about a quarter of a stop slower, working best with a 500-650 rating.

To push or not to push

However, while there's very little difference in the speeds at which these films give their best performance, the variations in ASA ratings notwithstanding, there is a considerable difference in the amount of individual pushability obtainable. This pushability is a measure of a film's ability to withstand the abuse of forced development and is more closely related to its inherent contrast characteristics than to its inherent speed. The flatter films, like Ilford's HPS and Gevaert's Gevapan 36, are better able to withstand the effects of forced develop-

ment without blocking-up in the highlights, and are therefore more pushable than the more contrasty materials like Agfa's Isopan Ultra and Ansco's Super Hypan.

Pushability, however, is not a measure of film speed and must not be used as a basis for establishing a personal user index. Ilford's two high-speed films, HP3 (which is rated at 200/160) and HPS (rated 400/320), serve as a significant case in point. With correct normal development both films produce their best results at effective film-speed ratings that are almost identical, our findings being 650-800 for HP3 and 800-1,000 for HPS. Using 800 exposures as a comparison it will be found that HP3 produces somewhat more brilliant negatives with finer grain and better gradation when both films receive identical development. HPS, being considerably flatter, requires an additional minute or two in most developers in order to match HP3's quality (in all respects, that is, save graininess).

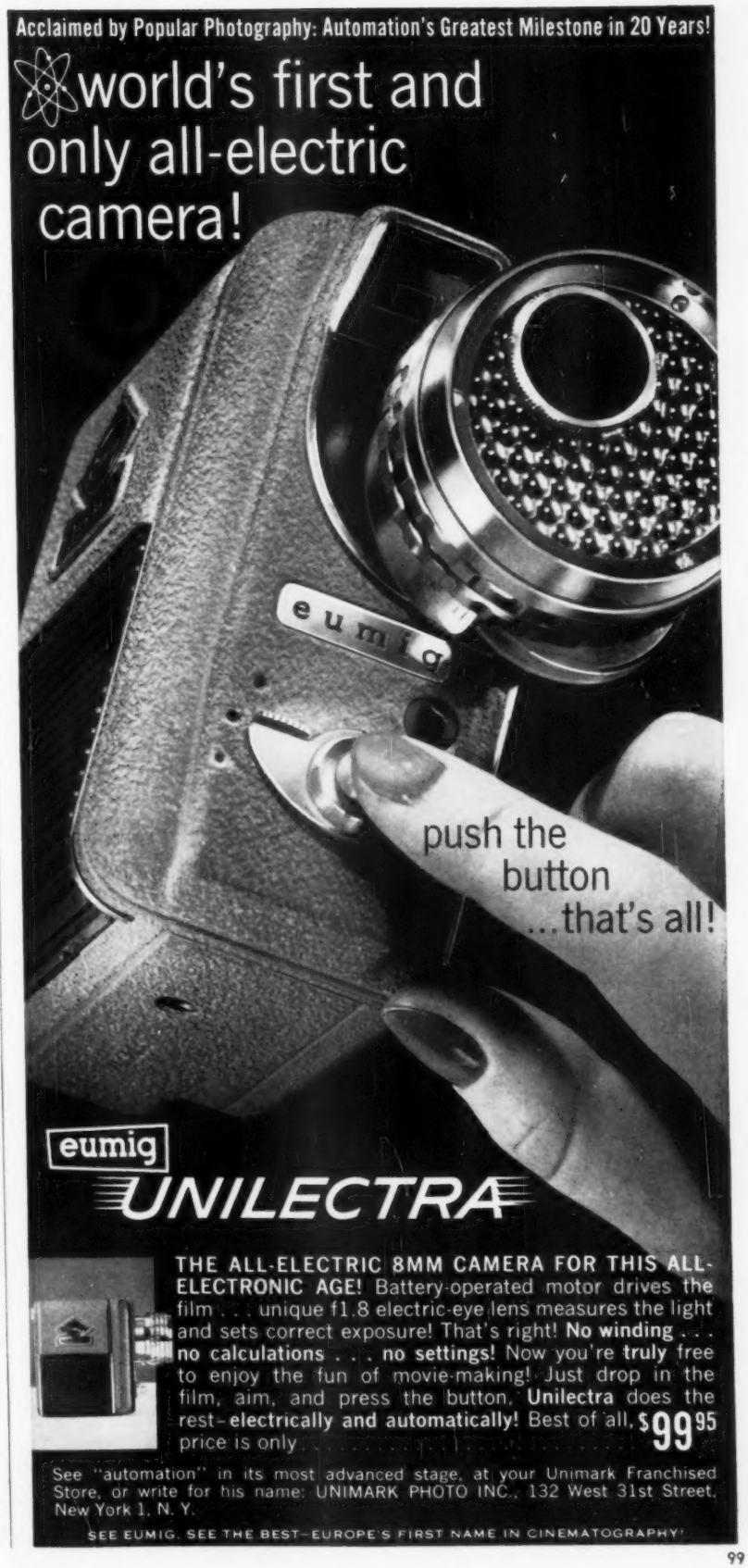
With forced development (amounting to an addition of approximately 50 percent) both films will deliver grainy, somewhat contrasty negatives with barely enough shadow density and excessive highlight density when exposed at impossibly high ratings of two and three thousand. Under these circumstances, HPS will produce somewhat *less bad* negatives than HP3. This is not, however, because HPS is capable of producing materially more shadow density under these conditions, but almost solely to the fact that in producing any given amount of shadow density under forced development it will produce somewhat *less* highlight density. In other words, because it is an inherently flatter film with more built-in resistance to blocking-up.

Forced development must be regarded as a last resort when confronted with badly underexposed negatives, and not as a standard operating procedure. The modern high-speed film has very much more resistance to highlight blocking than its slower predecessors, and with full normal development it will usually come up with a less grainy, better quality negative. When pushed, however, it proceeds to build grain (and to destroy image sharpness) at a very much faster pace and, it is worth noting, while certain now-discontinued old-time high-speed films couldn't come within a stop of the modern films when both are developed normally, they could actually withstand forcing somewhat more gracefully. Which is to say, again, that the result of this abuse would be less bad, but never good.

The truth about the modern high-grain film is quite simple: They're a pack of sissies that just can not stand up to the abuse of forced development. Any speed we get from them must be obtained with *normal* development. Otherwise they'll turn any scene into a grain field.

Fallacies and delusions

The Fallacy of Underdevelopment: High-speed films are equally unresponsive to underdevelopment, a failing which stems once more from their inherent flatness. For, given a reduction in develop-



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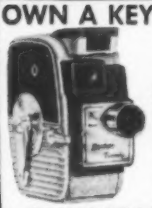

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ing time sufficient to materially improve their grain and as sure as anything can be in photography, you'll have a negative that's too flat to print. Or, if printable, will fail adequately to represent any but the most horribly contrasty subject and/or lighting conditions. Full normal development, which really means no more than the minimum amount required to obtain necessary shadow density and readily printable contrast, is as much a requirement as the avoidance of overdevelopment.

The Density Delusion: In handling high-speed film, and especially in evaluating negative quality in relation to the choice of effective exposure indexes and development times, it is important to be able to distinguish between density and *printability.* Frequently, a thinner negative will contain more printable detail than a very much heavier one. This is a characteristic of certain films which combine extremely low fog levels with great inherent gradation. *(Good examples are Agfa's Isopan Ultra, Ansco's Super Hypan, and Du Pont's now-discontinued S-X Pan.)* Density by itself is valueless; what helps us to produce photographs is not mere density, but the *differences between adjacent densities.* To obtain these vital density differences with flatter high-speed films we must produce a heavier set of individual densities than is necessary with more steeply graded films like Iso Ultra and Super Hypan. Even so, the thing to look for is not the quantity, but the quality of the densities produced. Many films are deceptive in this regard, giving negatives which look "thin," but print "heavy." The place to judge negative quality is, of course, in the enlarger and on a sheet of normal-contrast enlarging paper. Examining negatives against overly-bright light boxes has probably been responsible for the production of more excess density than all other photographic foibles. Negative quality is a matter of printability, not density.

About Royal-X Pan: Royal-X Pan is the fastest film in the world and, though awarding it an ASA rating of 650, the Kodak Company advises exposures based upon an effective speed index of 1,600. This speed is, of course, accompanied by considerably more grain than is encountered in regular high-speed films, but the quality is otherwise surprisingly good. For some reason best known to itself, Royal-X seems to have an affinity for DK-60a, an old-line tank developer of the treat-'em rough school, and for no other formula that we've been able to discover. Our tests indicate that Royal-X Pan roll film is not, at present, quite as fast as the sheet-film version. For this reason we're recommending a nice conservative rating of 1,600-to-2,000.—

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NEW BOOKS

COLOR PHOTOGRAPHY TECHNIQUES, by Arthur Kramer. Universal Photo Books, New York. 120 pages, soft cover, $1.95.

A handily comprehensive compilation of color data covering films, filters, light sources, exposure determination, processing, printing, and just about everything else worth having in ready-reference form, Arthur Kramer's recent *Color Photography Techniques* is the paper-and-ink justification of that tired bromide of the book review trade: "No photographer should be without it."

Based very largely upon the official data promulgated by the various manufacturers in a myriad of handbooks and poopsheets, this is the answer for the man who knows what he wants to know, but not where to find it. With a remarkable economy of language flavored by a breezily factual style, the author leads off with a succinct introduction to color theory and keeps going until he's led the reader verbally through the currently important print processes, dye transfer, Printon, and Type C. In so doing Kramer may not have broken new ground, but he has, at least, ably charted some old areas and performed a valuable service for his fellow photographers. At this low soft-cover price, the serious color worker who doesn't keep a copy within reach ought to have his emulsion examined.—*B. S.*

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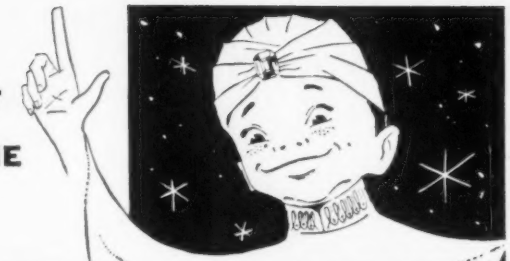

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MOVIES

OUR CHURCH MOVIE IS A HIT

Here's how amateurs produced an outstanding, low budget film

Actors in 1860 clothes walk to log cabin church while cameraman follows action. Cameraman (below) shoots high-angle close-up of hands working on blueprints.

By REV. DON BUNDY

Recently, Rev. Don Bundy of the Congregational Church of Rochester, Minn., stopped in our office. He was on his annual vacation in New York and had brought with him a film (in sound and color) which had been made by members of his church. He explained that the film was 30 minutes long and had been made by amateurs at a cost of less than $300. We were skeptical—until he screened the film for us. Rev. Bundy's film shows that amateurs can make films of near professional quality. There are churches and other organizations in almost every town which would sponsor a movie if they knew how to make one at as low cost, and of as high quality, as this one. This is why we asked Rev. Bundy to write the story of his film. While his story is about a specific church film, we feel that the information he gives can be applied by any organization which would like to produce an excellent, low budget motion picture.—Ed.

NO Hollywood talent scouts have offered us contracts. The local theater has not cancelled its first-run feature in order to put the name of our church in lights. But we are feeling plenty proud of our Centennial Motion Picture project which has just been happily received by our own church people. Even more appreciated than the "family compliments" received on our 30-minute movie are the favorable comments of those not in the church at all but who are pleased to see our story of the past and the many ministries of a modern Protestant church.

A Century of Christian Service is the title of our 16-mm color movie which has a narration on magnetic striping on the film. The usual centennial

pageant is presented once or twice and then forgotten or at best remembered well only by those who worked so frantically to get everybody into it, appropriately robed and adequately rehearsed for the crucial performances. Rather than a poor memory of a pageant we now have a permanent pageant on film, something that we can use over and over again to tell the story of our church, its beginnings as well as its present life and activities.

Many midwestern churches are having or nearing their centennial birthdays. A year ago our committee set our centennial goals. The traditional pageant, of course, was discussed and after the liabilities were matched with the assets, the idea was rejected in favor of a more modern medium. New times call for new techniques. Among the advantages are these: A permanent record of significant events in history is kept; many ideas can be done photographically which are quite difficult to portray "in person"; the people participating in the movie will have finished their work and can be part of the viewing audience and finally, smaller groups work together easily, reducing both the tension and the time usually spent on a full-blown pageant.

Our committee saw a dual purpose in our film; (1) To show some highlights from the past, trying to incorporate particularly some of the devotion and staunch faith that kept our forefathers strong in the pioneer days, and (2) to show how this heritage of faith and devotion was still underlying the multiple ministries of our modern church. About half of our film is devoted to history, which is partly authentic and partly imaginative. Some committee members researched the available records and historical documents. The first services were held in a log school house, a fact which suggested an obvious opening sequence for the film. A memorial log cabin in the local Mayo Park was selected for filming a family of the 1860's walking through the snow to church. Authentic parts of our history were depicted in the movie by filming drawings and sketches of old church buildings used through the century. These pictures appear only briefly in the finished film; the narration describes them adequately. Several past ministers are also presented in rapid succession on the screen, in their luxuriant beards and stern faces. Headlines from newspapers of earlier days and close-ups of the minutes taken at early Ladies' Aid meetings were other historical records included.

To have a commercial firm make a movie running a half-hour would be far too costly for most churches. It has to be a do-it-yourself project, and that makes it a learning project, too. To do its job well it must be superior in quality to what most people think of when they hear "home movies." To meet this requirement get some professional help, or make professionals out of your help. All members of the committee directly involved in the movie project should read one or two books on how to make good movies. Two excellent ones are Eastman Kodak's *How to Make Good Home Movies* and *Handbook of Basic Motion Picture Techniques* by Emil Brodbeck. Then

continued on page 116

TEN HELPFUL HINTS

1 Talk a great deal about what you "might do" and then reject every idea that does not advance the story or fit your abilities, budget, or equipment.

2 Prepare your shooting script carefully and in detail; paper for planning is far cheaper than film and saves editing hours, too. Be sure you are all clear on your purpose or story line.

3 Whenever possible, rehearse. Let people know what is expected of them. Run 'em through the action. Then film it. Rehearse the camera, too, planning when and where you will move the camera. The "run-through" technique saves hours and money.

4 Be sure equipment is in good shape before starting a major project. A test roll shot under simulated conditions will tell you if you are really ready to make a movie.

5 Roll film is the obvious choice for economy. For large audiences 16-mm film is required. Single-perforation film permits wider sound striping and better fidelity.

6 A shooting speed of 24 frames per second yields smoother pictures and better magnetic sound.

7 Use the instructions that go with lights, meter, camera, and film, and follow time-tested rules of filmers who know.

8 Outdoor sequences avoid many lighting problems.

9 A tripod should *always* be used. (Remember and respect this rule and then violate it only when you must.)

10 Remember that movie making is creative and fun. Keep friendly with your co-workers. Talk out problems. Avoid "prima donna" disputes.

CREATING WITH FILM

By CHARLES REYNOLDS

Each year there are many new books published on home movie making. Some of them are good, but most rehash the same old material. We have all felt a need for a book that is of use not only to the beginner or to the advanced amateur but to *all* amateur movie makers regardless of their knowledge of the subject or the equipment they own. In order to fill this need we are publishing HOME MOVIE MAKING, first of a new series of *Popular Photography Workshop Annuals*, which is the first annual ever published on this subject. It will be on sale, at newsstands and in camera stores, October 28.

We have tried to design a book that will grow with you as you continue to make films. It will contain articles that will help the beginner who has never handled a camera before, as well as the advanced amateur who has been making movies for many years. It contains articles, all by top experts in their fields, on subjects from scripting and titling to the best techniques for filming children.

There will be an article on editing by a top editor with the CBS Television Network telling how you can make the most of your home movie footage. There will be a section, illustrated in color, devoted to ways to get the best results with your color film. A technical expert with Cinerama has contributed an article on how to care for your equipment. There is a large section on professional-quality lighting for the amateur, written by a top expert in the field of movie lighting. The book will open with a symposium of top names in film making on how the amateur can make better films. A section on *100 Home Movie Ideas* will be devoted to script suggestions for amateur films, which should help answer the commonly asked question, "What should my film be about?" A large section of the book will be a completely illustrated guide to the many different ways to add sound to your films. Also included will be a complete directory of motion picture equipment and a special 16-page book supplement on *Secrets of Successful Film Making*.

This *Workshop Annual* is something that I am, personally, very enthusiastic about. I think that it's the best dollar's worth of movie-making information on the market today. We have all worked hard to make it that way.—

KODAK BROWNIE GOES AUTOMATIC

THE Brownie 8-mm movie camera has joined the ranks of the built-in exposure meter. Eastman Kodak Company's answer to the current trend is the Brownie Scopesight camera. Its design is clever indeed, for it permits the moviemaker to control his exposure while filming, yet preserves the Brownie's traditional competitive price level. Here's how the Scopesight system works.

A single click-stop knob on the camera's side is cross-coupled to the diaphragm and the built-in exposure meter. The meter's pointer is a black horizontal needle, clearly visible in the telescopic finder. When the needle is near the top of the finder's frame, the film will be underexposed. Conversely, should the needle be near the bottom, overexposure will result. By turning the side knob the needle can be centered exactly in the frame (assuming that illumination is sufficient), and exposure will be right on the button for the average scene.

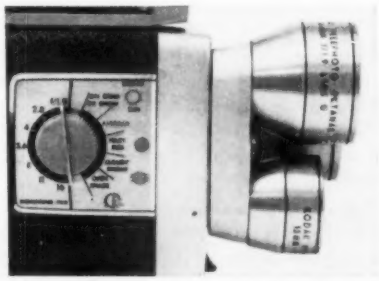
The Scopesight system combines exposure control with considerable flexibility. It permits the user to deliberately underexpose for a silhouette effect, or to "overexpose" to compensate for backlighting. Even more important, it works equally well with emulsions of various speeds. The moviemaker can adjust the lightmeter for use with films rated from 10 to 40 ASA. Moreover, it should be easy to find the correct meter-needle setting for exposure with even faster emulsions. Thus the Scopesight camera is not apt to grow out-dated.

Surprisingly, the lens-diaphragm is a series of Waterhouse stops, ranging from $f/1.9$ to $f/16$, in steps of half f-openings. One would expect that, by changing apertures while filming, one or more frames would slip by, unexposed. According to the manufacturer, this won't happen in practice, because of the speed at which the spring-loaded aperture-control knob operates.

Kodak has provided the new camera with some very convenient refinements. There is a device that prevents the film from unrolling while loading or unloading. The footage counter automatically resets to "load" when the camera is opened. Adjacent to the lens is a shifting lever for flicking either a built-in Skylight or a Type A filter (for using indoor film outdoors) in front of the prime lens. If the Type A filter is in shooting position, a pointer in the finder, near the top, tells the filmer so. The finder can even be adjusted to suit the moviemaker's vision, from −2 to +4 diopters.

The Scopesight camera comes in two models. One has a fixed-focus 13-mm $f/1.9$ lens, permanently mounted. However, the lens does take 6.5-mm and 24-mm and telephoto auxiliary lenses. The other model is identical, but has a turret with the converters built in. Since the diaphragm and filter provision are incorporated into the prime normal lens, the moviemaker can switch lens systems freely without upsetting exposure or color quality. The finder of both models shows the coverage of all three lens fields, and has a parallax indicator for each. Camera speed is 16 frames per second only.

The Scopesight system adds up to a great deal of automation, considering its modest cost. Price of the single-lens model is $79.50, its wide-angle and telephoto converters are $14.75 each. The turret model is $99.50.



Control center of Scopesight exposure system is single click-stop knob next to winding key. It is cross-coupled to camera's built-in meter and Waterhouse-stop lens diaphragm.

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Keystone KA-3 f1.8	113.95
Keystone K-25 f2.5	37.50
Keystone K-33 f2.5	58.50
Keystone K-38 f2.5	69.96
Keystone K-42 f2.5	58.50
Keystone K-48 f2.5	84.00
Kodak Brownie f2.3	21.00
Kodak Brownie f2.7	22.50
Kodak Brownie f1.9	29.95
Kodak Brownie Turret f2.3	44.95
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Kodak Medallion f1.9	89.95
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Revere CA-2	126.00
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Revere 64 f1.9	142.00
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Wollensak 28 f1.9 Raptar	101.00
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Wollensak 43-D Turret f1.8	74.50
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Here are some of the many thousands of new lenses available. Complete bargain price lists with names and manufacturers available upon request.

Lenses for Contax S, D, ConSol, Pentacon Hexacon, Super D, Ritacon, Pentacon F, FP, Praktica, Praktiflex, Asahi-Pentax, Miranda, Rival, and Tower Cameras.

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35mm f4.5 37.00	90mm f3.5 55.00	200mm f5.5 74.00	800mm f6.3 562.00
40mm f3.5 40.00	100mm f4.5 33.00	240mm f4.5 187.00	1000mm f6.3 825.00
50mm f3.5 41.00	105mm f3.5 33.00	250mm f5.5 85.00	
55mm f2.2 48.00	105mm f2.5 125.00	300mm f5 156.00	
75mm f1.5 162.00	135mm f3.5 49.50	400mm f5.5 133.00	

Lenses for Leica, Leica M-3, Nicca, Canon, Tower Leotax, Kardon, Miranda, Tanack, and Similar Cameras

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28mm f5.6 85.00	100mm f2.8 49.00	180mm f5.5 59.00	500mm f4 434.00
35mm f3.5 48.00	105mm f2.5 120.00	200mm f3.5 165.00	640mm f9 112.00
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85mm f2.8 57.50	135mm f4.5 36.00	300mm f5.6 182.00	

Lenses for Contax I, II, III, Contax IIA, IIIA, Nikon S-1, S-2, SP, Miranda, and Similar Cameras

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25mm f4 133.00	85mm f4 79.00	135mm f3.5 59.50	250mm f5.5 97.00
28mm f3.5 118.00	100mm f2 172.00	135mm f4.5 48.00	300mm f5.6 179.00
35mm f3.5 70.00	105mm f2.5 120.00	150mm f4.5 51.00	400mm f5.6 141.00
50mm f3.5 51.00	115mm f3.5 134.00	180mm f4.5 63.00	500mm f5 434.00
			640mm f9 112.00

Lenses for Exakta, Exa, Miranda & Similar Cameras

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35mm f4.5 37.00	80mm f3.5 52.00	150mm f5.5 41.80	500mm f5 296.00
35mm f3.5 44.50	85mm f2.8 59.00	180mm f5.5 59.00	600mm f5 543.00
35mm f2.5 55.00	90mm f3.5 55.00	200mm f5.5 74.00	640mm f9 112.00
40mm f4.5 41.00	100mm f2.8 49.00	240mm f5.5 81.00	800mm f6.3 562.00
50mm f3.5 41.00	105mm f3.5 33.00	250mm f5.5 85.00	1000mm f6.3 825.00
55mm f1.9 127.00	125mm f2.5 125.00	300mm f4.5 149.00	
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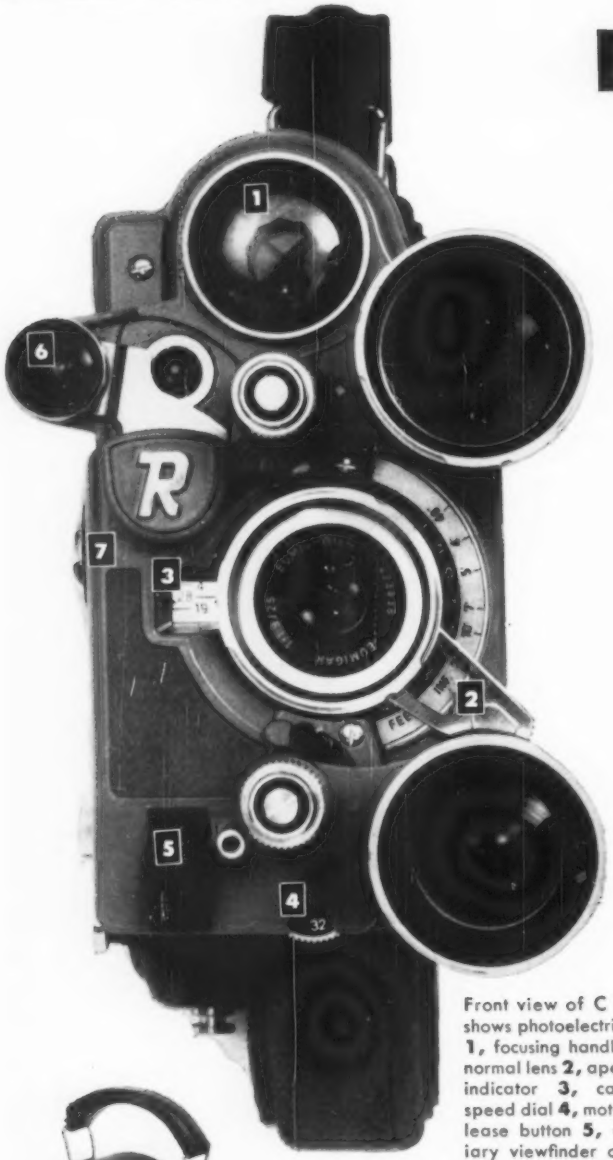
EUMIG C 16 R

New 16-mm camera features semi-automatic exposure, novel footage indicator, and foolproof viewfinder system



Front view of C 16 R shows photoelectric cell **1**, focusing handle for normal lens **2**, aperture indicator **3**, camera speed dial **4**, motor release button **5**, auxiliary viewfinder objective **6**, and lens-stop control wheel on side **7**.

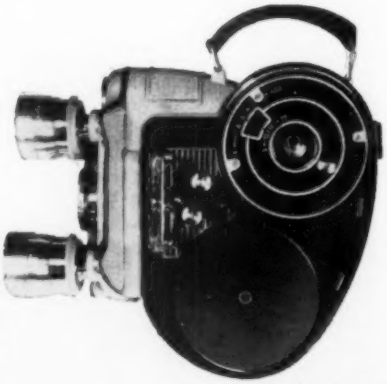
THE new Eumig C 16 R is a sturdy, beautifully engineered camera with many unique features which make it the most exciting new 16-mm product to appear in some time.

In keeping with the general trend in new movie equipment, the C 16 R has semi-automatic exposure control. The photoelectric cell is located directly above the lens and is coupled to it. The meter needle moves across the viewfinder field as the lens aperture is changed. When this needle is lined up with a stationary pointer, the exposure is set. The fixed pointer is positioned when a dial inside the film compartment is set for the exposure index of the film to be used; the pointer's position never changes. To guard against its position being accidentally changed, the dial which sets it is located *inside* the camera under the top roll of film.

The camera is fitted with a 25-mm Eumigar *f*/1.9 lens. Two converter elements for wide-angle (12.5-mm) and telephoto (50-mm) swing down into place in front of the normal lens. As each element is swung in front of the normal lens a corresponding objective viewfinder element swings in front of the finder. Thus, it is *impossible* to match the wrong viewfinder element with the wrong lens.

When the objectives are used, the normal lens must be set at infinity. If this is not done, the objectives will not swing into place—another safeguard against mistakes.

An important feature of the Eumig is automatic parallax correction with the normal 25-mm lens. As the focus is changed, the viewfinder automatically adjusts. The other two lens elements have their parallax ad-



Three-quarters view (left) shows camera resting on special cradle which remains screwed to tripod while camera is quickly lifted off by undoing catch. Circular area beside winding handle contains footage indicators. Side view (right) shows camera opened. Top film spool is removed to show dial on which film speed is set. This positions fixed pointer in viewfinder. Meter needle is then lined up with this pointer as lens aperture is set.

justed by a dial on the viewfinder. The numbers on this dial are conveniently color-keyed to the supplementary lenses.

One of the real joys of this camera is the viewfinder system. It is one of the best we have ever seen on a 16-mm movie camera. The objective elements actually change the magnification of the picture viewed. They do not reduce the size of the frame itself as in many types of finder. Slits at either side of the finder area allow the operator to see if something is going to enter the shot before it is actually in the frame. The viewfinder also has a special micrometer adjustment of the eyepiece to fit the operator's eyesight.

Another innovation on this camera is a unique type of auxiliary footage indicator which is located on the side of the camera over the regular footage dials. This indicator consists of five narrow slots. When the camera is fully wound, white shows through all five of these. As the motor runs down a circular plate turns underneath these slots so that a red area replaces the white. When the fifth area is completely filled by red the camera motor stops. In our tests we found this visual indicator to be useful not only as a check on the reserve spring power but also as an indication of the relative shot lengths without recourse to figuring after checking the numbers on a footage dial. This indicator, while a very simple idea, is an extremely valuable feature of this camera.

The C 16 R has a provision for mounting on a tripod which can prove very helpful under practical shooting conditions. Instead of screwing directly onto the tripod, the camera is mounted on a special cradle which, in turn, is screwed onto the tripod. When the time comes to hand-hold the camera, it can be easily lifted off by undoing a simple safety catch.

Other features: 16-ft spring run; speeds: 16, 32, 48, 64 fps, and single frame (with cable release); automatic exposure operates from ASA 6 to 400; retractable loop formers for easy threading; lift-out pressure pad for cleaning film gate. Price, $499.95.—

World's Largest Photo Market

continued from page 59

with these publications plus television and the movies for their readers' attention. And to compete successfully and get across the company message or corporate image, they had to adapt and use these new techniques in their publications. Their continually increasing acceptance of the "new" photojournalism has made them the top market for pictures.

In trying to sell to these increasingly sophisticated company magazines, it's important to realize that the intended audience of each may vary widely. The largest group is intended solely for employees, and they are called "internals." "Externals" are edited for such diverse groups as stockholders, customers, dealers, retailers, and the general public. Some publications will be tailored for several

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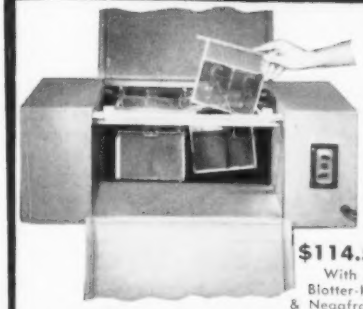

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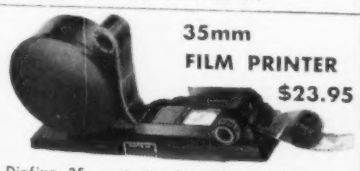

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groups at the same time, so their approach will necessarily be broader than those of publications designed for a single audience.

How does a photographer being to sort out the different industries and their publications with the idea of selling them?

One good way is to visit the nearest large public library to see a copy of the Gebbie Press *House Magazine Directory*, with a listing of 4,500 magazines, their needs, rates, and manner of obtaining material. Another excellent source is *Printers' Ink Directory of House Organs* with a listing of 5,000. Gebbie's, which is published every three years, is intended for the free-lancer and provides him with information in appraising the market. The *Pinters Ink* directory is intended primarily for industrial use and gives chiefly a simple, alphabetical listing.

Photographers far from the publishing centers of the United States might easily discover house magazines published in their own localities. By corresponding with or calling upon them, a cameraman can learn ways of selling some of his favorite stock pictures over and over. Or he might be able to interest some editors in picture stories he's made and never sold. If he's a beginner, the photographer may find editors who'll take the interest and time to spell out their criticisms and their needs. He can use these smaller-budgeted magazines as a source of income while perfecting his craft for larger and better paying publications.

The variety of assignments can be endless. My hottest job came while working in a steel mill open hearth—the coldest while photographing a story on snow removal during a blizzard in Massachusetts. Recently I've gone from doing an impressionistic feature on a New York laboratory to an Arizona copper mine. Once I followed a huge semi-truck on its run from New York to Chicago for 24 hours, taking pictures and driving a Volkswagen at the same time. Hitting a snowstorm which slowed us up meant 24 sleepless hours. But the pictures were worth it.

Some magazines will work on assignment, paying prices comparable to those paid by the consumer magazines. Others will buy stock pictures for covers or inside use. Some are looking for stories of general interest, and there is a wide demand for shots of products in use and clever merchandising ideas.

And while there may seem to be only a limited number of first rate magazines in the field which use pictures judiciously, the trend is moving in that direction. Companies are learning the value of presenting themselves in a halo of mature publishing quality.—

HOW TO SELL PICTURES TO HOUSE MAGAZINES—

1. Check your library for a copy of *Gebbie's* or the *Printers' Ink* directory of house organs. The former is broken down by subject matter as well as by industries.

2. Select the magazines most likely to be interested in your pictures. Then obtain copies of the publications you want to sell to either at the library or by writing the companies for them.

3. Study the publications for their use of pictures. What subjects are used? Are the pictures seasonal? Are series, photo stories, or single pictures used? Are stories long, do pictures run full page, are strong close-ups included? Check credit lines to see if some types are obviously made by staffers or the same photographers each month.

4. Look through your files for pictures or plan a rough outline for a picture story the magazine is likely to buy. Be alert to pictures showing a company product in use or activities related to the firm's line of business. Many will use pictures of plant or branch social and community events.

5. Call upon the editor if possible. Show your work and present your story outlines. If you can't see the editor, query him with a letter about your story outline or send a sample selection of pictures you think will interest him. If you're angling for an assignment, show pictures similar to those the publication uses.

6. Join and become active in any local house organ editors group so that you can meet the editors. The personal contacts you'll make will be invaluable when you want to show them your pictures.

How to Make Your First Color Print

continued from page 81

difficult to judge. The best indication is their shadow density, just as with black-and-white negatives, but the over-all orange cast from the integral masking layer in Eastman color negative materials is a complicating factor.

The shadow density can be seen in simple monochromatic terms and evaluated quite easily by viewing the negative through a green color separation filter such as the Wratten No. 61. Without investing in this filter, though, here's a trick that will permit you to compare the color negative's shadow density with that of a black-and-white negative you know to be correctly exposed: Lay an unexposed sheet or tail-end from a roll of processed color negatives over the black-and-white. Now, the color negatives in question and the correctly exposed black-and-white negative may be directly compared, side by side.

It is also important that the subject of your first print lend itself to critical color evaluation. Have a good idea in your mind's eye of how the subject looked, and aim in printing for a true representation as well as a pleasing one. Flesh tones are best, with neutral grays running second. Strong, pure hues of red, green, and blue

are also desirable. We can't stress too strongly that most of the time and trouble spent making the first print will be wasted if a poorly exposed or off-color negative is used.

THE COLOR MATERIALS

Ektacolor Paper is a three-emulsion-layer color material coated on a paper base. Designed specifically for producing positive prints from Kodacolor and Ektacolor, the paper's individual red-, green-, and blue-sensitive emulsion layers translate the film's negative color record into a positive image suitable for viewing.

The complicated filter packs we use in printing Ektacolor Paper do nothing more than adjust the relative amounts of exposure given the three individual emulsions, which in turn controls the relative color densities in the processed print—and thus color balance. (Actually, there are two systems for exposing Ektacolor Paper: The *white-light method* treated in this article and recommended for general color work and the *tri-color method*, generally used in large production labs, in which the paper's three emulsions are exposed separately through red, green, and blue filters. Here, color is controlled by varying the time of the three exposures.)

We are dealing with a negative-to-positive process, which quite conveniently is the same sort as conventional black-and-white printing. The same general thinking holds true for both, then: making a print lighter by giving less exposure, darker by more exposure, lightening areas of the print by dodging, darkening others by burning in.

As we have stressed previously, thinking in terms of color and color filtration is never easily mastered. However, an analogy might be helpful: compare the color relationships of Ektacolor Paper with the more familiar terms of black-and-white printing.

First, understand that *color indicates the presence of light*, not the absence of it. An increase in red in a color print, for example, means that the red-sensitive layer is lighter and transmitting more red; it DOES NOT MEAN that this layer is darker.

Now in black-and-white, if the print is too light, we increase exposure. And similarly in negative color, if a color is too strong, we must increase the exposure for its particular layer.

This is accomplished by placing a filter of the same color in the light path. The filter in effect increases the relative exposure for that particular layer by cutting back the intensity of the other two colors.

Thus, if there appears to be too much of a given color in the print, add a filter of the same color to the filter pack.

Conversely, if a print is lacking in a given color, remove a filter of the same color from the filter pack.

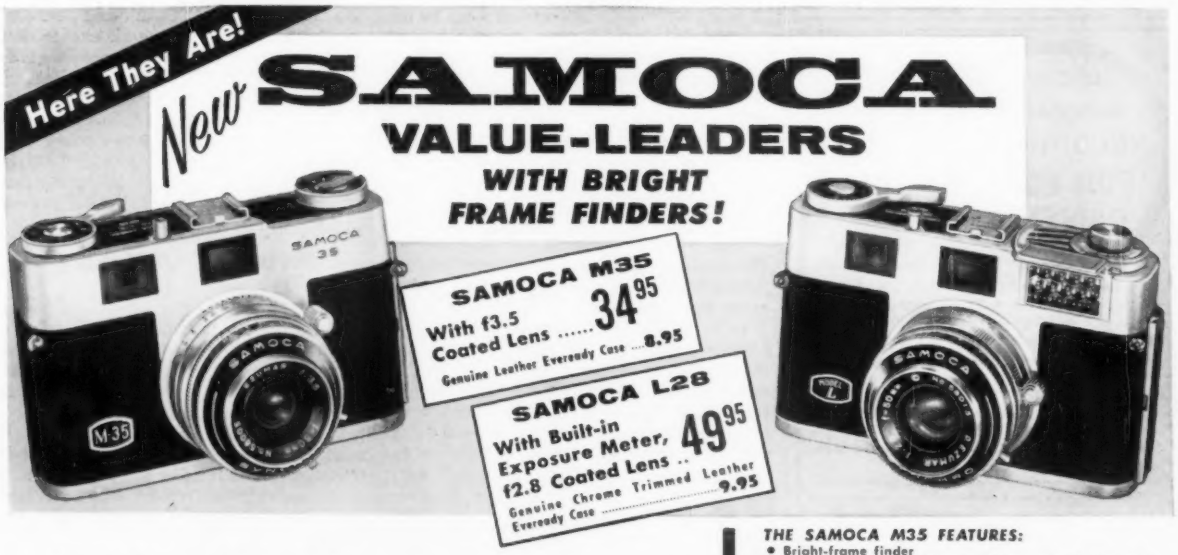
Ektacolor Paper is very sensitive to heat and humidity. At room temperatures, the three color emulsions are quite unstable. Storage of the paper at room temperatures for any period of time will cause shifts in their relative speeds, changing the color balance of the paper; prolonged storage will cause not only color balance changes, but introduce uncorrectable shifts in curve conformation and contrast between the layers, resulting in a definite loss in quality of prints.

Due to this, Ektacolor Paper must be kept refrigerated at a temperature of 50 F or lower. As soon as you get your first package of paper home, pop it into the refrigerator or deepfreeze. We'd suggest wrapping it tightly in a plastic bag or film, for even though the inside paper package is moisture-tight, the outside envelope can get quite soggy in some refrigerators (besides, jam stains on an Ektacolor Paper envelope look terribly unprofessional).

In use, remove the paper package from its cold storage place several hours before opening, to prevent moisture condensation on the sheets.

Return the package to the refrigerator immediately after the printing session, carefully folding over the mouth of the inner envelope several times to keep moisture out of the now opened package.

There's another complication with Ektacolor Paper. Unavoidably, different emulsion batches vary enough in color balance to nearly always require a change in filtration. Happily, this difference will be the same for all negatives, so you can determine through test prints a new basic filter pack for your master control negative, then use exactly the same filter difference between the old and the new



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basic packs for any negative whose filter pack is known for the old paper. Stocking up on large quantities of a single emulsion number avoids having to restandardize your basic filter pack often. If you take care to observe storage and use precautions, the filter balance should remain constant throughout the entire batch.

Color processing chemicals

The Kodak Color Print Processing Kit, P-122 contains all the necessary chemicals to mix the seven Ektacolor Paper processing solutions. The smallest kit, a one-gallon size, is best for tray processing. Follow mixing instructions implicitly. One pointer: contrary to black-and-white practice, start off with a gallon volume of water as the instructions carefully state.

Color chemicals are more liable to contamination than black-and-white. For safety's sake, whenever possible cycle through solutions in their usual processing sequence, for it is in this order that they are most tolerant to contamination. Follow this procedure in mixing, and also in pouring chemicals back into bottles from trays.

As to life of the chemicals, Kodak rates all chemicals but the developer at about 25 8x10 sheets per gallon. The developer, however, is a different matter. For consistent results, Kodak recommends that a tray of developer be used only once—whether to develop several prints at a time or only one—then be discarded. One quart of developer should be used for each run. In making your first good print, when you will be processing long series of test prints, this runs quickly into a second gallon of developer. At the time you purchase the processing kit, lay in at least one extra gallon of P-122 developer, which is separately available at $2.98.

This breaks down to 75 cents per quart, for each development—a considerable figure. There are several ways to cut this cost down:

1) At least during the early, rough test prints, when filtration is not too close to the final result, you'll be perfectly safe in processing one, then a second test in the same quart of developer.

2) A second method is to make only contact prints for the first test runs. A little 4x5 tray can be used—only about 8 ounces of developer will be needed, and the whole series of test strip and test prints will use up only two sheets of 8x10 paper and less than a gallon of developer. Here's how to do it: Place the negative in the enlarger, adjust to give the desired 8x10 final image size. Stop down as usual. Now, take the negative out of the carrier and tape it to a piece of glass, lay the glass (in the center of the enlarger image field) and negative over a small piece of Ektacolor Paper.

When final exposure and filter pack have been determined, simply replace the negative in the enlarger and make an 8x10 blow-up. Exposure and filtration should be exactly the same as seen on the contact prints. There's no reason to use small trays for solutions other than the developer. While the developer is discarded after tray use, the other chemicals are returned to their respective bottles for re-use. Another point in favor of making contact test prints is that while running a test series you can make several print variations at once, to see which change in filtration or exposure produces the best result.

About the developer: this is the most critical step. Temperature must be held throughout development to within one-half a degree of the recommended 75 F. Time must be *exactly* 12 minutes. An essential part of this is draining the print for the last 20 seconds of the developing time, placing print in stop bath as the timer rings. Agitation is also important. Follow as best you can Kodak's agitation recommendations given in *Printing Color Negatives*, attempting to standardize on a technique that you can repeat exactly for each print.

Use of the optional Rapid Fixer bath to view the print while still wet half-way through processing is strongly recommended as a time-saver if you plan to make the next print immediately. Ektacolor Prints take on a definite muddy blue cast until completely dry, making exposure difficult and color impossible to judge. Bathing the print for one minute in undiluted Rapid Fixer Solution A shows the print as it will appear when dry. Rapid Fixer is a 2-solution fixer concentrate used in black-and-white processing. For Ektacolor Print evaluation, only the Part A solution is used, full strength. Rapid Fixer quickly loses its ability to clear up the print if diluted. For this reason, each print should be drained when removed from the just-previous Hardener Fixing Bath and carefully squeegeed off to remove all excess liquid before immersion in the Rapid Fixer. Let print sit one minute before viewing, and while the maximum time is not critical, for good prints that will be expected to last, limit the time to five minutes. Temperature of Rapid Fixer is not critical, but you might as well place it in the temperature control bath with the other processing bottles.

THE EQUIPMENT

Enlarger

Your major darkroom item—color or black-and-white—is the enlarger. Most enlargers capable of making satisfactory black-and-white prints can be used for color, with these exceptions:

Some cold light enlargers cannot be used. These do not emit a full color spectrum, or are so lacking in red that excessively heavy filtering would be necessary, resulting in over-long exposure times. Some cold light models can definitely be used, without too long exposure times. It's best to contact the enlarger manufacturer for his recommendation, and an estimate of the filtration required and working exposure times.

Tungsten-light enlargers present no problems of color filtration. Older condenser models should be checked for green-tinted condenser lenses. Don't be frightened when you pull yours out—most glass has a slight greenish look when viewed end-on. Place a single condenser lens on a sheet of white paper. Viewed from above, there should be no definite

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color difference between the paper seen directly and through the lens. If there is, they should be replaced. Actually, the reason for not using them is that the thicker middle of the condenser will throw a decided green spot in the middle of the paper.

Voltage control

Variations in line voltage make a surprising difference in both color temperature and intensity of the enlarger lamp. Whether this affects you depends entirely on local conditions—both the stability of the voltage delivered to your door by the power company and the condition of your home wiring. Many areas routinely experience voltage variations which make acceptable color prints well-nigh impossible to produce without an additional investment by you in a voltage-controlling device. In some areas, voltage is extremely stable and no independent regulation is necessary. (Actually, if you have voltage problems, a voltage control is a good investment even for black-and-white printing.)

Voltage variations may also originate inside your home. If your wife plugs her electric iron into the circuit you're using for the enlarger, your next print may be inexplicably much too blue and too dark. Arrange to tie in the enlarger by an extension cord to the house circuit with the least variation in load.

Before you set up for color printing, query your local power company on line voltage changes in your area. Variations of only five volts in either direction will make your color printing quite difficult. The solution to all this is a voltage regulator. Small automatic models that provide a steady voltage to the enlarger lamp in spite of line changes can be purchased for as little as $30.

Color filters

The filters used in color printing are thin, flexible sheets of accurately dyed material. Not protected by sandwiching between glass like ordinary picture-taking filters, they must be handled carefully to avoid scratching or fingerprinting their delicate surfaces. Six colors are available: red, green, blue, cyan, magenta, and yellow, with six different strengths of each, .05 (weakest), .10, .20, .30, .40, and .50 (strongest). Used separately or in combination, they provide precise control over any one color or range of colors in the print. The various strengths are additive: two .20 red filters together produce the exact same filtering effect as a single .40 red.

Kodak makes two basic types:

Color Correction (CC) Filters. These are made of optically pure gelatin, for use in the image-forming light path such as on the camera lens or, in printing, at the enlarger lens. The basic recommended set for Ektacolor Paper printing consists of 19 filters: the complete series of red, magenta, and yellow, plus an always used No. 2B to filter out unwanted untraviolet. Color filters are designated by type (CC here), strength (.30, for example), and color (R for red)—CC30R. The basic set of CC filters, then, is: CC05R, CC10R, CC20R, CC30R, CC40R, CC50R, CC05M, CC10M, CC20M, CC30M, CC40M, CC50M, CC05Y, CC10Y, CC20Y, CC30Y, CC40Y, CC50Y, 2B.

Introducing filters into the image path (either in shooting or in printing) causes some loss in sharpness and contrast. Though seldom noticeable with a single filter, stacking up several will soon result in a definite loss of image quality. This is why the entire series of the three filter colors is recommended for color printing so that as few filters as possible will be needed to make up the filter pack. If possible, the 2B filter should be permanently located above the negative to reduce by one the number of filters in the image path. Don't fear for the sharpness of your prints, though. Even if the 2B is used below the lens, only two or three filters will print all but problem negatives. With three or less, there's no serious threat to quality *providing filters are kept scrupulously clean, and scratched or dirty ones immediately replaced.*

CC filters are made in two-inch (60 cents each) and three-inch squares ($1 each). The smaller size can be used with most enlargers. A Kodak Filter Frame (95 cents for either size) provides the most convenient means of combining the several filters into one pack. About the simplest way to hold the filter pack below the lens, permitting easy removal for a change of filters without moving the enlarger, is to place it on the red safelight filter holder (for black-and-white printing or Varigam filter holder). Chances are you don't use the red safelight in black-and-white printing, so if it's permanently mounted in the frame, cut it out.

The worry of image degradation due to the filters can be obviated by positioning them between enlarger lamp and negative, where the light is merely a quantity of focused illumination, not yet image-bearing. This is a better answer to color filtration, but it requires an enlarger with a color head or filter drawer above the negative for easy access to the filter pack. And much larger filters are needed, the CP series.

Color Printing (CP) Filters. Available in larger 5-, 6-, 8-, 12-inch squares, these are made in exactly the same strengths as CC filters, though only in cyan, magenta, and yellow. CP filters are acetate, less expensive than the gelatin CC filters, and cannot be used below the lens. Since the numbers of filters used above the negative does not effect definition, only eleven CP filters are needed for full color control: CP05M, two CP10M's, CP20M, CP-40M, CP05Y, two CP10Y's, CP20Y, CP-40Y, and a CP2B.

The 5-inch or 6-inch sizes (priced at $1.20 and $1.60 respectively) are big enough for most enlargers. Some makes and models come factory-equipped with provision for above-the-negative filtering, some have a color head available as a separate accessory. Above-the-negative CP filters are preferred if your enlarger can use them—you'll be happier with them in the long run. Though CC filters must be maintained in mint condition to prevent loss in sharpness, CP filters can be permitted to accumulate a fair amount of finger prints and scratches—thus do not have to be handled as carefully and will yield much longer use. Any necessary holder for CP filters can be supplied by the enlarger manufacturer.

CC or CP, your filter investment will be about the same, for though CC filters cost less, fewer CP's are needed. It'll run about $15 for most enlargers, though for some it might be as high as $30.

Color-printing literature

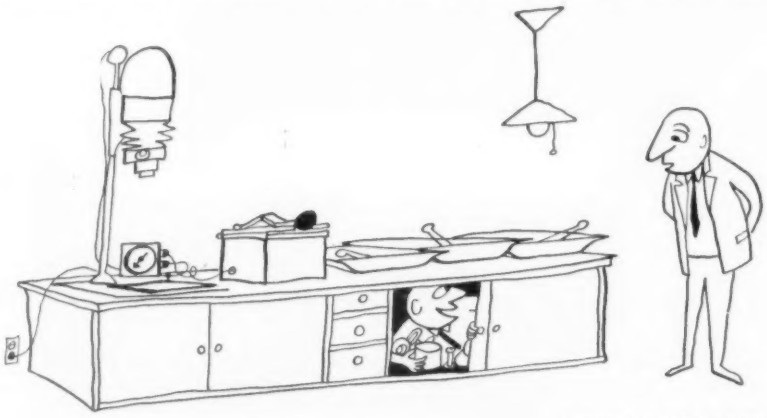
A clear knowledge of color printing will be as important to you as the Ektacolor Paper itself. Sit down and study these Kodak publications before you mix your first P-122 chemical:

Printing Color Negatives. Just-released Kodak color data book that is the prime reference today for color negative printing. Bound in the center is a simplified guide for beginning color printing that should be open on your darkroom work table—this is what you will use with our *Color Filtration Technical Supplement* in figuring filtration. Available from Kodak dealers for 75 cents.

Kodak Color Print Process P-122. Data sheet packed in chemical kit. DO NOT DISCARD—Contains essential processing information not found elsewhere.

Kodak Ektacolor Paper. Data sheet packed with paper. Repeats instructions given in data book, but reread them anyway.

Kodak Color Handbook. General reference for Kodak color materials. Includes, among others, data books *Color As Seen and Photographed* and *Kodak Color Films*, both with valuable sections on color and color negative materials. Actu-



ally a loose-leaf book, available from Kodak dealers for $5.

These also may be useful:

Kodak CC Filter Data Guide. Circular slide rule for fast, accurate calculation of filter pack changes. Recommended after you learn simple system printed on center pages of *Printing Color Negatives* data book. From Kodak dealers, $2.

Black-and-White Prints from Kodak Color Films. Short, general description of making black-and-white prints from color transparencies and color negatives. Pamphlet E-21 available without charge from Sales Service Division, Eastman Kodak Co., Rochester 4, N. Y.—*Gene Gaines*

My Wife Built a Darkroom

continued from page 66

side of the darkroom to the other.

As the breadwinner of the family, I was away at the office during most of the work. Each night, over a period of a week, I'd come home and find my darkroom progressing by leaps and bounds.

Here's how she worked:

First, she got a large wooden box from a store in our neighborhood. The box supplied just about all the lumber she needed for an enlarger table and shelving. She took the box apart carefully and utilized almost every piece that came out of it.

Second, following her plan, she nailed up wooden strips along the walls. The strips would support the shelving and enlarger table. Under the enlarger table she added "L" brackets which would give the table extra support. The enlarger was the heaviest piece of equipment in the "room." According to the plan, the enlarger would be on the left side of the darkroom and the processing trays on the right. Developer, short stop, and hypo would be lined up on one shelf (in 8 x 10 trays) and on the shelf below would be an 11 x 14 tray with rinse water in it.

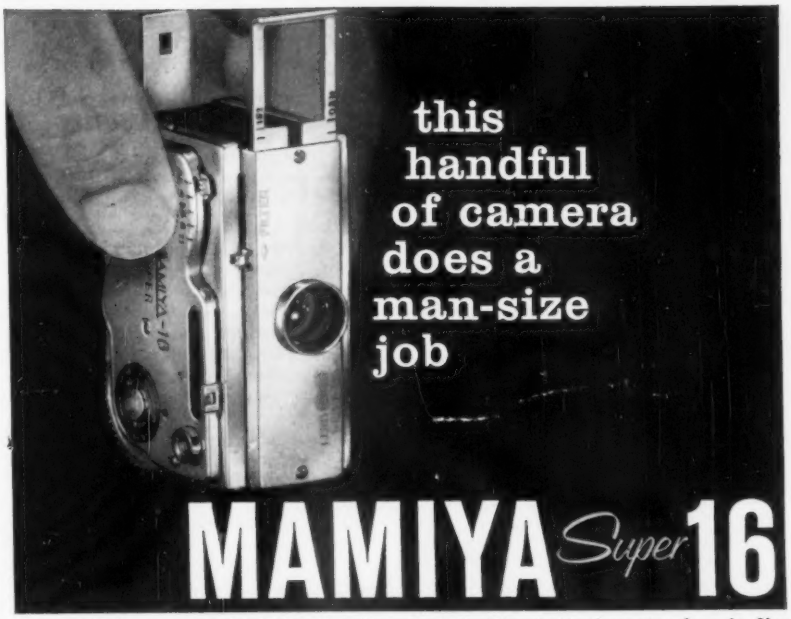
Third, the shelves were either painted or covered with a plastic sheet. According to my wife's reasoning, if some liquids were spilled they could be mopped up from the plastic with ease.

Fourth, she lined the walls around the trays with a shower curtain, thus protecting them, and the shelves below from accidental splashing.

Fifth, she positioned the safelight-roomlight combination gooseneck lamp so it would light the important areas.

Sixth, she put a fan on a shelf high in the closet, and made an opening in the bottom part of the plastic sheet which covered my door so that air could circulate freely in the room. Stale air is one of the biggest problems in closet darkrooms. I feel she solved the problem very successfully.

After my first few processing sessions I found out how clever my wife was. With a few small touches, like adding hypo elimination solution to my water rinse tray, I had a complete, easy-to-use, easy-to-clean darkroom. So, fellas, I suggest that if you can make a big enough nuisance of yourself around the kitchen, you too may find yourself with a closet darkroom.—



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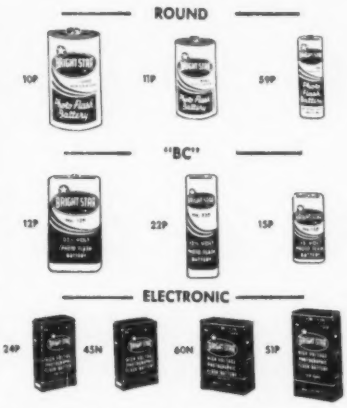

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COLOR PRINTING

A Technical Supplement

1 EVALUATING COLOR PRINTS

Successful Ektacolor Paper printing depends much on your ability to recognize errors in density and color balance, and your ability to correct them by changing your two basic printing controls—*exposure time* and *filter pack*.

To aid the beginner in color, here is a by-the-numbers outline for evaluating test prints and for figuring the new filter pack and new exposure time.

In order to firmly establish the relationships between the six basic colors, we've reproduced a color wheel, right. Red, green, and blue are the primary colors; cyan (minus red), magenta (minus green), and yellow (minus blue) are the subtractives. Notice their location on the color wheel: cyan is between blue and green, therefore is a cold blue-green, and magenta is blue-red in color.

Think of all colors in your print as interrelated. If the print is too red, then magentas and yellows will also appear too strong, while blues, greens and especially cyans will be lacking in intensity. In evaluating your print, you must decide which color—or combination of colors—is in excess, and which are lacking. Keep the color wheel in front of you and consider each of the colors around the wheel. It will be a considerable help to you in forming accurate, confident judgments.

Now follow these steps:

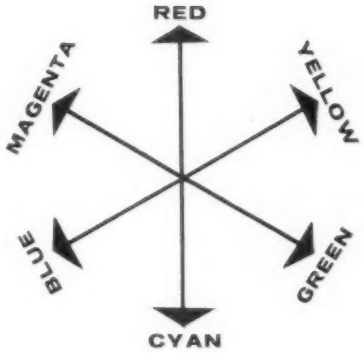
1) Evaluate density. Is overall appearance too dark or too light? Are the highlights washed out due to lack of printing exposure, or dark and muddy due to too much exposure? Figure a new exposure based on your black-and-white printing experience.

2) Evaluate print for color balance. In which sector of the wheel does the color error generally lie. Is the print too warm? Too cold?

3) Study color-sensitive areas—flesh tones, light areas, neutral grays—to pin down the single color or combination of colors in excess. Keep color of original subject in mind as clearly as possible.

4) Check color wheel. The colors you decided were in excess should lie grouped together on same side of wheel, colors on opposite side should be lacking.

5) Some prints are more easily evaluated in terms of colors lacking, rather than in excess. Remember—there is a plus-to-minus relationship across the wheel. Too much blue is the same as too little yellow, its counterpart at the opposite end of the axis.



6) Now try to pin down the error to a single color, in terms of color in excess.

7) Decide magnitude of error. Kodak's *Simplified Color Printing Chart* (which you'll use to find a new filter pack) rates color errors from "very slight" to "a lot."

8) Compare this print with the previous print. Think back through the change made in the filter pack to see if it produced the expected result.

9) Keep clear, complete notes on your evaluation. You'll refer to them later.

2 FINDING A NEW FILTER PACK

After you've reached a decision as explained above, turn to the *Simplified Color Printing Chart* in the Kodak Handbook *Printing Color Negatives*. (The version of this chart for below-the-lens filtering is reproduced on opposite page.) There are two tables in this chart: Table A is used only for the first change in filter pack. Table B is used for all subsequent filter pack changes, giving the filter values that must be added to or subtracted from the old pack. These changes often cannot be simply made (subtracting a 10M filter from a 50R pack, for example) and paperwork will be necessary.

Here are a few rules for figuring out the new filter pack, working with our red, magenta, and yellow filters:

RULE: FILTERS OF THE SAME COLOR ARE ADDITIVE IN VALUE. Thus, one 40R has exactly the same filter effect as two 20R's.

RULE: A RED FILTER HAS THE SAME EFFECT AS A MAGENTA AND YELLOW COMBINED. For example: a 20R equals a 20M plus a 20Y.

RULE: IF MAGENTA AND YELLOW ARE BOTH PRESENT IN A FILTER PACK IN AMOUNTS OF 10 OR MORE, CUT DOWN NUMBER OF FILTERS BY CONVERTING AS MUCH MAGENTA AND YELLOW AS POSSIBLE TO RED. For example, a filter pack of 30R plus 20M plus 10Y requires three filters. However, this can be converted to a two-filter pack of 40R plus 10M.

FOLLOW THIS STEP-BY-STEP PROCEDURE

1 Obtain filter correction from *Simplified Color Printing Chart.*

2 Use this as filter pack if correction can be simply combined with old pack, and result does not include both magenta and yellow.

3 If new pack does contain both magenta and yellow, break down old pack into magenta and yellow values. Do same with new filter correction.

4 Add together total magenta and yellow values.

5 Now convert as much as possible of this to red. This is your new filter pack.

Here's an example of how the above instructions work. Let's assume that your old filter pack was a 50R.

Step 1: Chart tells you your filter correction is, let us say, "SUBTRACT 20M."

Step 2: These two filters can't be simply combined.

Step 3: Let's break each into magenta and yellow values. Old pack, 50R, equals 50M plus 50Y. Correction required is minus 20M.

Step 4: Add them together. 50M plus 50Y minus 20M equals 30M plus 50Y.

Step 5: Now combine your M and Y values into R as follows: 30M plus 30Y equals 30R. This leaves a remainder or 20Y.

Your new filter pack: 30R plus 20Y.

3 SIMPLIFIED COLOR PRINTING CHART

TABLE A. CHANGES IN GELATIN CC FILTERS AT THE LENS AND CORRECTED EXPOSURE TIMES

	IF PRINT IS	NEW FILTER PACK	BEST EXPOSURE TIME (IN SEC) FOR CC50R										Factor
			5	6	8	10	12	16	20	25	32	40	
			Time Corrected For New Filter Pack										
TOO RED	VERY SLIGHT	50R +05R	6	7	10	12	14	19	24	30	38	48	1.2
	SLIGHT	50R +10R	7	8	10	13	16	21	26	32	42	52	1.3
	MORE	50R +20R	7.5	9	12	15	18	24	30	38	48	60	1.5
	A LOT	50R +30R	8.5	10	14	17	20	27	34	42	58	68	1.7
TOO GREEN	VERY SLIGHT	40R +05M +10Y	6	7	10	12	14	19	24	30	38	48	1.2
	SLIGHT	40R +10Y	5	6	8	10	12	16	20	25	32	40	1.0
	MORE	30R +20Y	4	5	7	8.5	10	14	17	21	27	34	.85
	A LOT	20R +30Y	4	4.5	6	7.5	9	12	15	19	24	30	.75
TOO BLUE	VERY SLIGHT	40R +10M +05Y	6	7	10	12	14	19	24	30	38	48	1.2
	SLIGHT	40R +10M	6	7	9	11	13	18	22	28	35	44	1.1
	MORE	30R +20M	6	7	9	11	13	18	22	28	35	44	1.1
	A LOT	20R +30M	6	7	9	11	13	18	22	28	35	44	1.1
TOO CYAN	VERY SLIGHT	40R +05R	6	7	9	11	13	18	22	28	35	44	1.1
	SLIGHT	40R	4.5	5.5	7	9	11	14	18	26	29	36	.9
	MORE	30R	4	5	6.5	8	10	13	16	20	26	32	.8
	A LOT	20R	3.5	4	5.5	7	8.5	.11	14	18	22	28	.7
TOO MAGENTA	VERY SLIGHT	50R +05M	6	7	10	12	14	19	24	30	38	48	1.2
	SLIGHT	50R +10M	7	8	10	13	16	21	26	32	42	52	1.3
	MORE	50R +20M	7	8	11	14	17	22	28	35	45	56	1.4
	A LOT	50R +30M	8	10	13	16	19	26	32	40	51	64	1.6
TOO YELLOW	VERY SLIGHT	50R +05Y	6	7	9	11	13	18	22	28	35	44	1.1
	SLIGHT	50R +10Y	6	7	9	11	13	18	22	28	35	44	1.1
	MORE	50R +20Y	6	7	9	11	13	18	22	28	35	44	1.1
	A LOT	50R +30Y	6	7	9	11	13	18	22	28	35	44	1.1

These factors are given only for use with times not covered here.

TABLE B. FINAL CHANGE (if needed) IN FILTER PACK

Amt. of Desired Change If Print is too . . .	Very Slight	Slight	More	A Lot
red	add 05R	add 10R	add 20R	add 30R
green	subtract 05M	subtract 10M	subtract 20M	subtract 30M
blue	subtract 05Y	subtract 10Y	subtract 20Y	subtract 30Y
cyan	subtract 05R	subtract 10R	subtract 20R	subtract 30R
magenta	add 05M	add 10M	add 20M	add 30M
yellow	add 05Y	add 10Y	add 20Y	add 30Y

THE KODAK COLOR PRINTING FILTER CP2B OR WRATTEN NO 2B SHOULD ALWAYS BE IN THE LIGHT BEAM.

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4 FIGURING NEW EXPOSURE

Final problem is to recalculate your exposure. As part of your print evaluation you decided whether or not exposure needed to be increased or decreased. However, this time will be thrown off if there is a change in either (1) the strength of the filters in your new pack, or (2) the total number of filters.

Here's how to make the necessary corrections:

1) Find factors for filter-strength change in table at right.

2) Multiply exposure time by factors.

3) Compare total number of filters in old pack with total number in new; then add 10 percent to exposure time for each filter more, subtract 10 percent for each filter less.

FILTER	If filter added, exposure factor is:	If filter subtracted, exposure factor is:
10R 10M	1.2X	0.9X
20R 20M	1.3X	0.8X
30R 30M	1.5X	0.7X

Example: Assume your old filter pack was 2B+50R. Your new pack works out to be 2B+50R+20M. The change in strength is the addition of 20M. Checking the table, we see the exposure factor is 1.3, give a corrected exposure of 13 seconds. One filter has been added, so add 10 percent to exposure time. 13 seconds plus 1.3 seconds gives a total of 14.3 seconds corrected exposure time.

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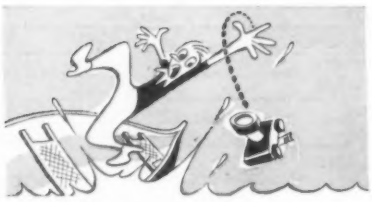

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Our Church Movie Is a Hit

continued from page 103

someone with a real knowledge of movie making, gained from successful experience in the field, should be called on. You will probably have a good moviemaker in the congregation. If he knows the difference between the ordinary and the excellent and can consistently produce accurately exposed and well-composed film, then you are in luck. Any technical advice you can get from a friendly professional or advanced amateur in your area will, of course be a great help.

The finished product has to be colorful and considerably above the average home movie, technically. We, therefore, decided to use 16-mm film which would permit showing the finished product in large auditoriums and even on television. A shooting speed of 24 frames per second was chosen in order to have a steadier picture and to have better sound fidelity.

(It would be possible to produce an adequate "low budget" movie using less expensive 8-mm film, if requirements do not include large screen showings, and if sound can be provided independently of the film itself.)

If the whole idea of making a movie seems out of the question in labor and cost you might take a single activity and make an interesting three- or four-minute film story. Show it to official boards to demonstrate that the idea has merit.

How much will it cost you to make a 16-mm half-hour film with sound narration? I can't say exactly because there are so many variables. Here are some of the factors to be taken into consideration:

1. Decide first whether to shoot in black-and-white or color. The attractiveness of color film makes it almost mandatory if the additional cost can be financed.

2. Decide whether to shoot at 16 frames or 24. Obviously the faster speed boosts the costs considerably. You can put voice on 16 frames per second, but music does not record quite as well.

3. Go to your nearest *very friendly* photo dealer and get some estimates on quantity purchase of film and processing. You are in the "semi-pro" league now and should not have to pay list prices.

4. In estimating how much film you will use, realize that the basic problem belongs to the planning committee. If plans for each part of the film are carefully blocked out in advance and in detail, great amounts of wasted film are avoided. At any rate, here is the kind of figuring you need to do: After deciding on the speed of film, multiply feet per minutes to find out how much film runs 30 minutes. Then add a third more film to it, because, even with careful planning you are apt to discard at least a third of what you shoot.

5. Again, go to that same friendly photo store. Buy or rent three or four No. 4 photofloods and reflector stands.

6. Ask your electrician how much current you can draw from your present outlets without dangerously overloading the wiring. It is well worth having a separate cable to supply your electricity while making movies.

7. Include the cost of someone doing the *editing* for the finished film. Here again careful planning is the keynote to economy. Well-planned sequences reduce substantially the amount of time necessary to rearrange, cut out, and insert parts.

8. Since there are several ways of adding sound to your movie and since all of the methods are different in price, you may wish to spend some time in discussion. The easiest and least desirable method is simply to narrate your commentary while the film is running. This can be done by standing up front and just talking or by speaking through the microphone which plugs into most sound projectors. A second method of providing narration and music is by means of a tape recorder. A combination method of music on tape for background with live narration over a microphone provides a fairly flexible technique and avoids the almost inevitable problem of the narration on the tape not matching the scenes in the movie A quite desirable and low-budget method is applying *magnetic sound striping* directly on your film. This is done at quite reasonable cost (2 cents per foot) and in effect turns the film itself into the tape of a tape recorder. The striped film is then run through a magnetic sound projector, usually available on rental from any large photo supply dealer (purchase price is around $800). As the film runs through the projector the sound track is put on the striping. The advantage of this method is obvious. You can match your voice and music to the actual scenes being shown on the screen. If you don't like the way it goes the first time, you can re-record over and over until you get it just right. Study carefully the manual which comes with the projector. Once you have finished what is a satisfactory sound track on magnetic striping you have a permanent sound movie with a small limitation—you must always run it on a magnetic sound projector if you want sound. The most elaborate solution to obtaining a sound movie is to have an optical sound track made for you professionally.

This discussion of how to get sound on film is not half so important as the question of "what sound?" The narration and music are vital ingredients. Words poorly chosen or poorly read are a ter-

HOW MUCH DID IT COST?

Color film and processing allowing for about ⅓ over-shooting (prices on raw film vary in different localities)	$170.00
Professionally made titles and credit sequences (titles can be made at much less cost by the local crew)	20.85
Magnetic striping	22.00
Special light cable and electrical equipment rental	25.00
Many, many hours of volunteer time	no charge
Total	$237.85

rible handicap even to excellent photography. Practice hard.

Many churches, of course, have used color slides to tell the story of church activities, sometimes for highlighting the annual meeting or showing the church school in action. These are easily made and are an improvement over the usual written reports. The color motion picture, on the other hand, supplies the priceless ingredient: living, moving action on the screen. The crucial difference in movie technique is movement. In good movie making this does not mean, however, that the *camera* moves—rather people move and a steady camera is the onlooker capturing all the emotion and movement provided by the actors.

Let's say you want to show the first grade of your church school learning about the life and times of Jesus in an easy, happy, constructive way. The teacher of the class explains carefully the current project, the making of a Palestinian village. Class members research the curriculum materials for pictures and ideas. From cardboard they cut the walls of Palestinian houses and with paste and scissors they make the outside stairways. From modeling clay some make wells. All of these ingredients are part of each Sunday's lesson time. This is excellent material for the movie camera because it is live action. Naturally, you cannot spend much film on just this one class. You must make every foot of film count. The thing the movie tries to tell is suggested by the narration which might accompany the sequence: "In our Primary Department children enjoy learning about the life and times of Jesus by actually recreating some parts of a village in old Palistine. They read the stories in the lesson materials. They hear stories from the Bible. They look up sketches and photographs of modern Palestine and then, using various materials, they put together the finished village. As they do, they learn easily the way Jesus lived and the way he spoke with people, the way he told about God's love for them."

The first task in filming this sequence is to get the children and teacher to ignore the camera, the lights, and the cameramen and put their minds on exactly what the class is doing. Since the sequence will last three or four minutes at the most we want to show several things in quick succession. With our lights covering the total class around the table we set up our camera to include the whole group. If our lights remain constantly in place it does not make a great deal of difference where we put the camera—the light intensity remains constant. As the scene opens we catch the class right in the middle of putting some finishing touches on a Palestine house. Another group of two or three children at the end of the table are rolling out clay for bricks to make the well. After the scene has been on long enough to establish what it is and to permit us to introduce it verbally, we stop the camera, change its location, and move in for a close-up of those two or three children

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making their bricks. We watch them as they begin to build the well. Another change of camera location and we focus on one or two faces of children intent upon what they are doing, smiling and talking to one another as they work. Change camera position and shoot the children pointing to something in the teacher's book as she holds it for them to see.

No one must look at the camera or at anyone outside of the class. First-graders will understand easily what they are to do if you simply tell them clearly and in a friendly way what you are trying to do and that you want it to look just exactly like a regular Sunday morning. Generally this kind of a sequence is best done in an early evening session. It should go smoothly and on schedule. This goal is reached if parents are enlisted and if all shooting plans are carefully laid out in advance. With the class parents on hand to watch, the whole experience becomes a church-centered family project.

If there is a key person in the management of our volunteer amateur actors and actresses, it is the one patient person who is able to telephone endlessly to tell parents clearly what is expected of children in the way of costumes, the amount of time that will be needed, and the essential importance of promptness. A constant principle of churchmanship must always be kept before the adults and children as well—"We are making this movie because we want to tell other people how much it means to us to work and learn in our church." We are not Hollywood stars trying to get ourselves in the limelight; we are people trying to enact part of our real life story so that others may see it and appreciate what the church means today.

If you plan to do something of a historical nature for part of the film, say an early meeting of the Ladies' Aid, your present women's organization can learn a great deal of value. They talk together about what they wish to show as representative of church women of decades gone by. There will be the old-fashioned costumes, and the funny hats of yesterday will be pulled out of attics all over town. But there will be more—the women of the past took their obligation to the church seriously. They worked hard for their church. Nothing came ahead of church in their loyalty unless it was their home. They were people of prayer and every meeting opened with devotions. They did things with their hands for others and one sequence might show them knitting for the missionary barrel that is to be packed for people in need.

Whoever plans this sequence showing the women's work of bygone years will find that much interest will be generated in the present organization. It is especially rewarding if you then ask the ladies to plan to show the modern woman's work fulfilling the ministry of the church. Perhaps a single circle of the Women's Guild, meeting in a member's home, can be condensed onto three or four minutes of movie film. Ingredients in this circle story include the chairman calling the meeting to order, a devotional leader reading from the Bible, the person in charge of the program handing out resource materials, the serving of refreshments, and finally the whole group singing around the piano. Once more the word is: Plan ahead. Place your lights. Check your camera angles. Rehearse the people once or twice rapidly and shoot.

The big questions to ask when forming the shooting script are these: what activity or action best tells the story, and how can we tell it visually in the least possible time and with the fewest possible words of explanation?

Movie making is fun. It produces fellowship. If it is church-centered, it helps its participants to understand church purposes. The finished movie can tell a thrilling story with impact and inspiration. If you decide to make a church movie, we wish you well—and hope that *you* have a hit, too!—▶

WHAT EQUIPMENT WAS USED?

Cameras: nearly all footage was shot on a Kodak Cine Special using a 25-mm and a wide-angle lens.
Brief sequences were shot on a Bolex H16 Reflex and a Bell and Howell magazine.

A tripod was used for practically all footage.

Film: Type A Kodachrome indoors, Daylight Kodachrome outdoors, and a few feet of Super Anscochrome.

Lights: two-, three- and four-lamp arrangements of No. 4 photofloods in suitable reflectors were used in most interior scenes. In certain large interiors two Groverlite Junior units (with Colortran Converter) were used.

Meter: Weston Master III

Magnetic projector: Bell and Howell 302

What's New

continued from page 38

WALZ EV-LV is an exposure meter designed for use with cameras having an Exposure Value or Light Value System. It reads directly and can be used with films having emulsion speeds of 10, 25, 32, 100, and 200. Price, $5.95; distributor, U. S. Photo Supply Co., 6478 Sligo Mill Rd., Washington 12, D. C.

BINODAPTER, Bushnell's device for fitting a special telephoto binocular to cameras for 7X lens power magnification, has now a self-aligning feature. Once properly aligned, it can be removed and replaced without further adjustment. Price, $19.50. Importer: D. P. Bushnell & Co., Inc., 430 Bushnell Building, Pasadena, Calif.

BROWNIE MOVIE TURRET camera accessories are announced by Ednalite Optical Co., Inc., 200 N. Water St., Peekskill, N. Y. An Ednalite Retaining Ring Set consists of a ring for each lens in the turret and is priced at $2.95. The Ednalite Filter Kit contains three hard-coated, optical glass filters,

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Photo by Hy Peskin, courtesy Sports Illustrated, © Time, Inc.

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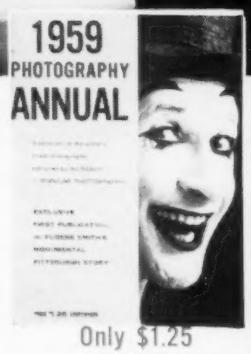

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ChromA (converts indoor color film to outdoor use), ChromHaze (haze eliminator), and 80B (converts outdoor film for use under photoflood illumination). Price, $6.50.

CAMERA BELT-POD is a camera support that clips onto the front of the photographer's belt. It weighs 6¾ ounces and extends to 20 in. Price, $7.95. Manufacturer, Photo Dynamics, 80 Wall St., New York 5.

TRIVAK is a unique camera support with three suction cups and a ball-joint head for mounting a camera where a tripod could not be used. Weighing only 7 oz. and 2½ in. high and 4¼ in. across, the mount is $6.45 postpaid direct from the manufacturer, Trivak Dept. 4, I. D. Enterprises, 1222 N. Menard, Chicago 51.

TRIPOD SELECTOR booklet on the Linhof tripod line, shows at a glance the tripods in scale, with maximum extension and available accessories. It is available from Linhof dealers or Kling Photo Corp., 257 Fourth Ave., New York 10.

CLAYTON P-60 Ultra Fine Grain developer is now packaged in unbreakable, translucent light-proof amber polyethylene containers. To preserve developer, bottle can be squeezed to remove excess air, then capped. Developer data is printed in yellow. Price per qt., $1.90. Manufacturer: Clayton Chemical Co., div. of American Photocopy Eqpt. Co., 2100 W. Dempster St., Evanston, Ill.

EASY-LOADER, the Ansco film package that provides 8 20-exposure 35-mm Anscochrome loads, is now available with a package of 8 new empty cartridges. Price, complete, $9.95. The package of 8 empty cartridges will be sold separately at 69 cents initially, $1.20 later. Manufacturer: Ansco, 40 Charles St., Binghamton, N. Y.

PANA-VUE is a combination table and hand viewer for 2x2 slides. It has a built-in light that turns on automatically when the inserted slide is pressed down. It operates on two standard C batteries. Price, $6.95. Importer: Sawyer's, Inc., P. O. Box 490, Portland 7, Ore., or 3500 N. Kostner Ave., Chicago 41.

ANGENIEUX LENS BROCHURE, covering the entire Angenieux lens line is again available upon request to Exakta Camera Co., 705 Bronx River Rd., Bronxville, N. Y.

CHARLES BESELER CO. of East Orange, N. J., has purchased the Projection Optics Co., Inc., of Rochester. The latter will continue the operation of the Rochester plant.

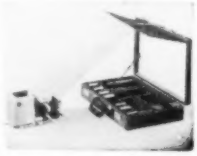
GOLDEN STARLITER electronic flash units are available for photographers who plan on working with negative color and Type C print materials. The 200 Series consists of five units, all self-contained, with 200 watt-second power packs and power selector switch for 25, 50, 100, or 200 watt-seconds; internal modeling lights; 1/500-sec flash duration, 8-sec recycling on high, 2 sec on low. Prices range from $229 to $256. Details on the above and on the 400 series available from Scheibe Engineering, Inc., Box 208, Burlington, Wis.

SYLVANIA M-5 and M-5B flashbulbs are further additions to the company's new line of zirconium miniature M-2-size flashbulbs with guide numbers equal to those of the larger Press 25 bulb. The M-5 and M-5B have a delay of 20 milliseconds for synchronization over the full range of shutter speeds at the M-synchronization setting. Price of the M-5 is 14 cents each; the blue-coated M-5B, 17 cents each. Sylvania Electric Products, 1740 Broadway, New York 19, is the manufacturer.

AMERICAN SPEEDLIGHT CORP., 63-01 Metropolitan Ave., Middle Village 79, L. I., N. Y. announces a new Series VIII circular electronic flash adaptable to larger, oversize lenses on many 35-mm cameras; a Series 800 Sunlight tinted reflector which eliminates need for a color compensating filter; the L429 light snoot attachment for standard P5 and P6 Ascorlight reflectors; and 5 new power supplies for many of the Ascorlight units. Full details and prices available.

ACCURA COILED FLASHCORD for Kodak cameras with direct-fitting flash guns extends to 5 ft. for off-the-camera flash effects, and coils down to 7 in. Named KO-KO, it is priced at $4.95; available from Spiratone, Inc., 369 Seventh Ave., New York 1.

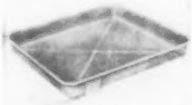
ATTACHE KIT, a self-contained slide-projection unit, contains a Minolta Mini projector with semi-automatic changer, screen, 8 compartments to hold 240 slides, extension cord, and a spare projection bulb. The unit weighs 7½ lbs, measures 17x12x3¼-in., and was prepared especially for travelers. Price, $89.50; available from Presentation Designers, 46 E. 53rd St., New York 22.



RADIANT glass-beaded and Uniglow screen fabrics to 72x96 in. in size are now available without seams. All models are supplied without a single seam with the exception of the 84x84 in. size. Manufacturer: Radiant Mfg. Corp., Box No. 5640, Chicago 80.

F&B BUTT-SPLICING BLOCKS for splicing 16- and 35-mm film are nonmagnetic and have sprocket pins to register the film. Magic Mylar tape is used to complete the splice. Model B-16 for 16-mm film is priced at $9.50; B-35 for 35-mm film, $12.50; Model B-4, for ¼-in. magnetic tape, $6.50; Model BSB, a combination block for all three, is $24.50. Full details from Florman & Babb, Inc., 68 W. 45th St., New York 36.

DEVELOPING TRAYS with a built-in drain permit emptying the contents without moving the tray and can also be used for print washing. Made of acid-resistant plastic, cross-ribs are molded in the bottom for easy handling of prints. Available in four sizes from 16x20, prices start at $8.95; deep hypo trays are also available. Manufacturer: Yankee Photo Products, 3325 Union Pacific Ave., Los Angeles 23.



POLAROID OWNERS are advised of the appearance of the Bower Self-Timer, especially designed to exert slow, even pressure (by means of an adjustable plunger) on the shutter release. After tripping the shutter, the plunger is withdrawn into the timer. The photographer is allowed about 20 seconds to "get into the picture." Price, $3.95; distributor: Saul Bower, Inc., 114 Liberty St., New York 6.

FILTER RETAINING RING NO. 3RS for the Kodak Brownie movie camera with an *f*/2.3 turret, is available in a set of 3, priced at $3.75 a set. Manufacturer: Tiffen Marketing Co., 71 Jane St., Roslyn Heights, Long Island, N. Y.

FLASH-SET is a combination rangefinder and flash-exposure meter. The rangefinder focuses from 3 to 100 ft. Setting the guide number dial opposite the distance scale indicates correct *f*-stop, if flash is used. Price, $3.95; manufacturer: Federal Inst. Corp., 12-10 Broadway, Long Island City 6, N. Y.

ASAHI-PENTAX ACCESSORIES are announced by Asahi Optical Co., Ltd., 521 Fifth Ave., New York 17. They include a bellowscope for close-up work up to 2 in. ($25), a set of 3 extension tubes for close-up work up to 4-in. ($14.95), a set of 3 46-mm screw-in filters (ultra-violet, light orange, and light yellow), a sunshade ($5.50), and a microscope adapter ($17.95).

PRINT-A-SLIDE is designed for making black-and-white prints from color slides. Prints are processed, without trays, in bottles with a plastic developing tube. Complete kit contains a horizontal enlarger with *f*/3.5 lens, 25 sheets of direct positive photo paper, developing tube, safelight and chemicals in ready-to-mix bottles. Refills are available. Price of kit, $29.95. Manufacturer: Gwinn & Hodges Co., 7509 S. Racine Ave., Chicago 20.—▶

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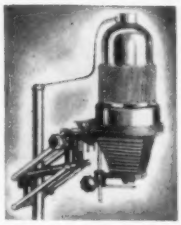
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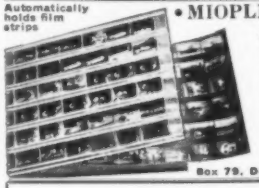

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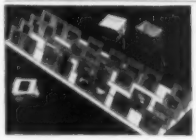

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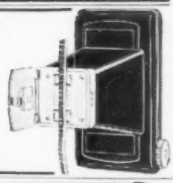

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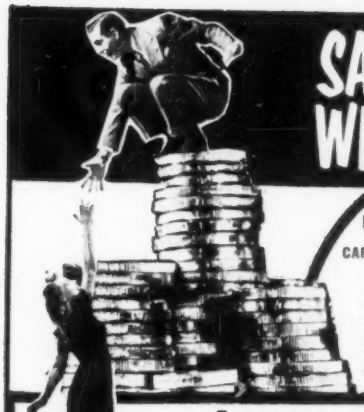

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FREE EXPOSURE METER

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Olympus 35S f1.8 ..
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- 1 sec to 1/500
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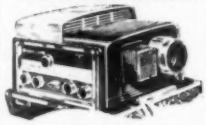

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List $149.50
Special Brand New
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Sankyo 8Y

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SIZE	TYPE	3 for	6 for	12 for
8mm x 25' Dbl.	Super X	3.29	6.39	11.29
8mm x 25' Dbl.	Tri-X	6.49	12.49	24.29
8mm x 25' Dbl.	Super XX	4.49	8.39	16.29
16mm x 50' Mag.	Super X	5.99	11.49	22.49
16mm x 100' Roll	Super X	6.49	12.49	23.89
16mm x 100' Roll	Super X Sound	7.49	14.49	28.29
*16mm x 100'	Negative Super-XX	3 for 2.79		
*16mm x 1200'	Neg. /Super-XX	2 for 13.99		

*Processing not included.

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Att: Studios and Professionals—write us on your letterhead for testing samples of KOH-I-NOOR paper, complete data and quantity prices.

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In original mfrs. packages • 1959 Date

Sizes	Kodachrome	Anscochrome
35mm x 20 exposures	3 for 4.79	3 for 3.69(R)
35mm x 36 exposures	3 for 6.39	
35mm x 28' with loader		7.95 each
8mm x 25' roll	3 for 6.19	
8mm x 25' mag.	3 for 9.69	
16mm x 100'		3 for 24.69

MORSE B 5 Film Developing Machine

3 stainless steel tanks, reel assembly, self reversing. Motor operates on 110 volts A.C. Film capacity: up to 9½" wide, 200' long..... **139.99**

K-20 AERIAL CAMERA

Guaranteed in perfect condition

K-20 with 6¾" f4.5 lens with 6-rolls 5¼" x 20' Super-XX 2-filters, and case for camera. **69.95**

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For processing of Aerial Film (K-20), 5¼" to 9½" wide x 20' long. Complete with three tanks. Gov't cost $102. **39.95**

Special Combination Offer . . .
K-20 Camera Outfit and Aeroflex Developing Outfit, both outfits for only.... **99.95**

35mm x 100' SAFETY FILM

Guaranteed till March 1959

Super XX, Plus-X, Panatomic-X, Ansco Supreme, Infrared, Microfile, Orthochromatic ASA64 — **2.49 ea.**

Positive 35mm x 100'.....1.50
35mm x 100' Day. bulk loader w. 12 empty cart. & cans.....5.49

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30x40	7.89
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40x40	8.89
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35mm x 100' new, latest emulsions

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• PLUS-X ASA 80
• TRI-X ASA 200+
3.49 each

35mm x 100' Daylight Bulk Loader with 12 empty cartridges and cans.....5.49

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Guaranteed in perfect condition. Complete with 7" f2.5 Kodak Aero Ektar lens, filters and magazine.

+ 6 rolls of 5½" x 26' Super XX film (1957 date) for use with K-24 camera. Gov't cost $529. **89.99**

MORSE G-3 TANK

Develops up to 100' of 8, 16 or 35mm film. Uses ½ gal. of solution. FREE with tank—6 rolls of 16mm x 50' Blue Base reversal. **25.49**

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Complete with 3 B & H lenses: 2" f4.5, 6" f4.5, 10" f4.5; one 400' magazine. **389.00**

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Outdoor or Indoor
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Guar. till Mar. 1959
NATIONALLY ADVERTISED BRANDS

Size	Type	Contrast	Quan.	Price
4 x 5	DWSM	#2	500 sh.	7.29
5 x 7	DWSM-DWGL	#1,2,3	200 sh.	4.69
5 x 7	SWGL	#1,2,3	200 sh.	3.99
8 x10	SW Lustre GL	#2,3	100 sh.	3.49
8 x10	DWSM	#1,2,3	100 sh.	4.99
8 x10	SWGL	#2,3,4	100 sh.	4.29
8 x10	SWSM	#1,2,3,4	100 sh.	3.79
8 x10	SW Portraya	#2	100 sh.	3.69
8 x10½	DW Portraya	#2	250 sh.	14.99
11 x14	DWGL	#1,2,3	50 sh.	4.49
11 x14	SWGL	#1,2,3	50 sh.	3.79
14 x17	SWGL	#1,2,3	50 sh.	5.49

9¾" x 200' AERO ENLARGING PAPER **4.89**
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Roll cuts into 240 sheets 8x10.
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Guaranteed till March 1959

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4 x 5	DWSM	200 sh.	3.99
4 x 6	DWSM	250 sh.	4.39
5 x 7	DWGL-DWSM	200 sh.	4.99
8 x 10	SW Lustre	100 sh.	3.49
8 x 10	SWSM	100 sh.	3.89
8 x 10	SWGL	100 sh.	4.49
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9⅜" x 500'	SWSG	1 roll	9.99

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Guar. till Mar. 1959
KODAK • HALOID • ANSCO

Size	Type	Contrast	Quan.	Price
4x5	SWGL	#1,2,3,4,5	300 sh.	2.69
5x7	SWGL	#1, 2, 3	200 sh.	3.19
7½x7½	SWGL	#1,2,3	250 sh.	3.69
7x9	SWGL	#3	100 sh.	2.19
8x10	SWSM	#1,2,3,4	200 sh.	3.69
8x10	Ad Type	#3,4	250 sh.	3.29
8x10½	Reflex Copy		200 sh.	2.99
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17x22	Reflex Copy		100 sh.	6.99
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8x10 Contr. Pro Pan	50 sh.	2.99
8x10 Process	25 sh.	1.29
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8x10 Ektacolor B	10 sh.	4.99
8x10 Printon	10 sh.	4.95
8x10 Anscochrome Tung	10 sh.	5.95
11x14 Comm I Ortho	20 sh.	3.29
11x14 Ansco Printon	10 sh.	6.95
11x14 Reprolith Ortho	50 sh.	15.99
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7" Aero Ektar Lens

Coated f/2.5. With click stop diaphragm. Ideal for high speed color. Perfect for 35mm reflex or press use.
Gov't cost $485.
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Adapters, complete with lens board, tubes and bed brace.

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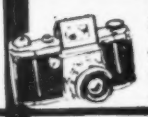

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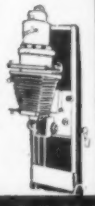

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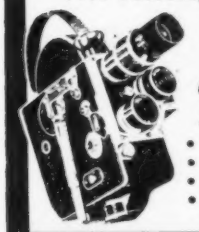

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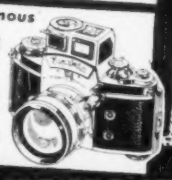

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3 Big Hi-Fi Speakers
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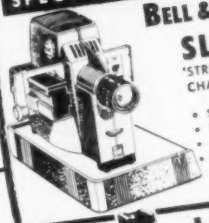

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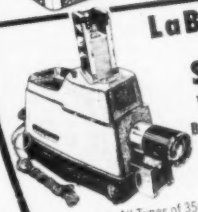

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Camera With Needle-Sharp f3.5 Coated Lens • DeLuxe Carrying Case • Fan-Fold Flashgun

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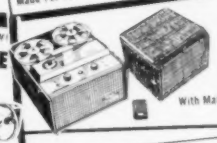

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With 4 Hi-Fi Speakers

Includes 2 Pre-Amplifiers, 2 Amplifiers, Mike, Reels & Tape, In Handsome Matching Cases.

A Complete Stereo System With 2 Speed Dual Track Cross Over Networks Stereo Playback, Monaural Recording.

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7 x 35 ..... 14.49

FREE: Leather Case & Straps

6x30 IF	13.49	8x30 CF	15.24
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Speedlight with Battery Pak

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High Speed—1959 Date
Orig. Factory Packed

35mm 20X list....$2.35 **3 for $5.95**
120 list ..... 1.75 **3 for 4.45**

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100 Sheet Packages Contrasts 1—2—3

	SW	DW
4 x 5	$1.39	$1.79
5 x 7	1.89	2.09
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Slightly outdated

AVAILABLE IN 8mm and 16mm

THE FOLLOWING FULL VERSION REELS

The 8mm is approximately 200 ft. and 16mm approx. 400 ft. each reel.

Charlie Chaplin Comedies—1 reelers—
NEW JANITOR! MABEL'S BUSY DAY, FILM JOHNNY, BETWEEN SHOWERS, CAUGHT IN THE RAIN, HIS NEW PROFESSION. — **2 reelers**—IN THE BANK, NITE AT THE SHOW, THE CHAMPION, THE TRAMP, HIS NIGHT OUT, DOUGH AND DYNAMITE. The price for silent is **$10.00** per reel and for sound **$12.50** per reel. 8mm **$5.00** per reel.

MACK SENNETT BATHING BEAUTIES—
Made direct from negatives
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Religious Films Available

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Crowns of Thorns .....8 reels
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16mm Sound.....$15.00 per reel
8mm .....$7.50 per reel

HAL ROACH COMEDIES—
Snub Pollard & other famous stars, full version—available in 8mm approx. 200 ft. **$5.00** per reel—16mm **$10.00** silent per reel and **$12.50** sound. Approx. 400 ft.

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ALL PRIZE FIGHTS—Heavy Weight, Light Weight, Feather Weight
Full Version
Available 200' 8mm .....$ 7.50
Available 400' 16mm $15.00
Fights from Early Days to Present

DEVELOPING SERVICE AVAILABLE

100' 16mm B&W.....$1.25
8mm 25' double B&W..... .60
8mm 25' double color..... 1.25
16mm 100' roll color..... 2.50
16mm 50' Mag. color..... 1.25
Above color prices refer to *Ansco Color* and *Anscochrome* only.

35mm FILM ASA 10

Ansco Color Daylight Outdated
100' $11.95
20 exp. roll..... 1.00
(3 for $2.75)

BULK FILM SPECIAL

- **Brand New Daylight Film Loader**
- **100' 35mm negative film** our choice
- **12 empty 35mm cartridges**

Yours for only $5.95

REGULAR MOTION PICTURE PRINTER
8 and 16mm.....Price **$125.00**

B & W 35mm Film 100' Roll
Negative film outdated.....$1.25

ANSCO COLOR FILM WITH PROCESSING

8mm 25' dbl. roll reperforated.....$2.25
8mm 100' on Bolex Spool reperforated.. 6.50
16mm 100' roll 5.00
16mm 100' roll sound 5.00
16mm 50' Magazine 3.50
Slightly Outdated

BLACK AND WHITE MOVIE FILM WITH PROCESSING

ASA 50

8mm 25' dbl. roll $1.15
8mm 100' on Bolex Spool..... 3.00
16mm 100' roll 2.50
16mm 100' sound ASA 24..... 2.50
16mm 50' Magazine 1.90
With purchase of 5 rolls, 1 roll free—outdated

USED CLEARANCE SALE

16mm Subjects Approx. 400' available in sound or silent.
For Home Use Only..... $4.95

16mm KODACHROME

100 ft. rolls—processing included. Reg. $10.00. Price **$6.00** per roll.
Slightly Outdated

KODACHROME Color Film Processing

8MM KODACHROME MOVIES:
25 ft. magazine.....$ .75
25 ft. roll..... 1.00

16MM KODACHROME MOVIES:
50 ft. magazine..... 1.00
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SPECIAL ON NEW 8mm AND 16mm SUBJECTS

(Cartoons, Comedies and Westerns)
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Made direct from negatives

50' 8mm .....$ 1.00
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ANSCOCHROME ASA 32

16mm with Processing

100' 16mm roll $8.00
50' 16mm Mag. 6.50
Orig. factory packed 1959 dated

DAYLIGHT ONLY

35mm ANSCOCHROME 20 exp.
RESPOOLED ASA 32
Our Price—**$1.25** per roll
3 rolls—**$3.50**
6 rolls—**$6.50**

COLORCHROME

8mm Roll ASA 32.....$3.25
with Processing within date
Reperforated

SPECIAL ANSCOCHROME 35mm
Outdated

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4 rolls 5.00
36 Exp.—per roll 2.25
5 rolls 10.00

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ASA 50
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4 25' double 8mm on camera spools..$ 1.79
16 rolls as above 5.95
64 rolls as above 22.00
15 rolls 16mm 100' on camera spools.. 17.95
27 rolls as above 29.00
54 rolls as above 48.00
NO PROCESSING ON ABOVE
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BULK MOVIE FILM ASA 50 NO PROCESSING

15 16mm 25' rolls.....$ 2.75
27 rolls as above 4.75
54 rolls as above 8.75
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27 rolls as above 10.75
54 rolls as above 19.50
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149.50 USED
f2 lens, 10 watt ampl. Complete. Shipped express.

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Brand-new f3.5 coated German Astra lens. Kodak Supermatic shutter. Uses 620 film. Gov't Surplus.
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11x14	Single weight semi-matte	3	50	5.75
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In Brand-New Alphax Synchro M-X shutter. Ideal for commercial and professional photographers. Famous lens from U. S. surplus now available at a price far less than you'd expect.
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Pre-set, hard "C" ctd. optics. For Exakta, Praktica, Pentacon, Astra 35, Astraflex 35, Praktina.
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Double Condensers

Silvered parabolic reflector. Extra masks, full bellows. Imported. Accepts Leica lenses.
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All with 3 or 1 flashpost. Interchangeable lenses. Focal plane shutter, 1/3 to 1/500. . . . 13.95
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Single lens reflex; interchangeable lenses and finders; internal coupling; synchro speeds; focal plane shutter 1 sec to 1/1000. Case 9.95 (sold with case only). Rangefinder prism 9.95. Leaflet available.
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10% DOWN BUDGET TERMS

TRADES ACCEPTED

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BRAND NEW **29.95**
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f1.9 AUTO XENON

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With import certificate and Exakta registration. Exp. meter as illus. additional.
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with f3.5 coated LENS

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Complete with case & flashgun. Synchro Rapid shutter.
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1½" f1.9 CINE AMITAR

8mm Tele, coated, focusing mount (specify camera). Case 75c. 65c post & handling
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300w blower cooled, coated 3" f3.3 lens, automatic features.
BRAND NEW **62.95**
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AUTO TARON
f2.8 coated LENS

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M-X Synchro Rapid Completely Automatic. Case 6.50
1.25 post & handling 5.00—DOWN

RETINA IIIc

92.75
2 Heligon
Cpld. rangefinder. Exposure meter. M-X Synchro. Case 9.75
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With f2.8 Zeiss Tessar; Pre-set diaphragm; focal plane shutter speeds 12 sec to 1/1000th.
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BRAND NEW **69.50**

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KODAK RETINA IIIc

with coupled rfdr. MX synchro, rapid wind built in mtr.

LIST 165.00

BRAND NEW **92.75**

Case 10.00

80mm f4	54.00
35mm f3.6	41.00
35mm f4	54.00

35mm MIRANDA REFLEX CAMERA

- 50mm F1.9 Soligor preset lens
- Focuses down to 18"
- Bright pentaprism finder (inter)
- Synchronized, flash and strobe
- Speeds 1 Sec. to 1/500 Sec.

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• complete LIST 199.50 with Registration and import certificates

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with prism finder, auto diaphragm, MX synchro, F2 lens, meter, rapid wind.

LIST 215.00

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New Retina Reflex Outfit with F2, 35mm wide angle, 80mm Telephoto, case and flash 244.95

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8mm Turret Camera

with exclusive Automatic Self Timer.

- 4 Governor Controlled Speeds
- Multi-Finder for Standard, Telephoto and Wide Angle lenses

Plus Geared footage counter. Single frame release. Exposure Computer, uses roll film, drop-in loading. Color Corrected coated F1.9 lens in focusing mount.

ONLY **46.88** Top Grain leather everready case ..... 4.95 Just arrived from Japan

FABULOUS FILM SALE

Latest dating. Factory fresh reloads your choice of Plus X, Trix, or Panatomic X

12 20 exp	3.00
12 36 exp	4.75
50 ft	7.25
100 ft	3.75
Roll Loader 100ft of film, 10 empty cartridges	10.25

Factory fresh reloads with processing included in price.

KODACHROME, ANSCOCHROME, EKTACHROME	35MM	3-20 exp. rolls	6.45
		3-36 exp. rolls	10.55
		3-stereo 15 rolls	7.99
		3-stereo 28 rolls	12.44

3— 8mm KODACHROME roll 25 ft	7.92
3—16mm 100 ft. KODACHROME roll	23.00
3—35mm Super ANSCOCHROME (20 exp.)	7.54
3—35mm Super ANSCOCHROME (36 exp.)	11.74

Add 7¢ per roll on film for postage & handling

USED LEICA CAMERAS & ACCESSORIES

Leica M 3 with F2 Summicron	257.50
Leica M 3 with F1.5 Summarit	274.50
Leica M 3 with D.R.* F2 Summicron	294.50
Leica IIIg with F2 Summicron	207.50
35mm F3.5 Summaron	58.00
90mm F4 Elmar	56.00
*Dual Range	LIMITED QUANTITIES

smallest 35mm PAX M3 CAMERA WITH

- 4 element f2.8 ctd lens
- synchro shutter
- single window rfdr., viewfinder
- auto rapid wind

NEW SPECIAL **34.95**

CASE 4.95

Latest Model BOLEX TURRET CAMERA WITH ELECTRIC EYE

Complete with 12½mm F1.8 Lytar lens. Variable shutter, auto-setting exposure counter.

BRAND NEW **169.50**

BRAND NEW CONTAFLEX, IKOFLEX, CONTAX, IKONTA

Contaflex L	83.00
Contaflex III	94.00
Contaflex III	115.00
Contaflex IV	125.00
Contaflex IV	67.50
Ikoflex IC, F3.5 Tessar	84.00
Ikoflex Favorit, F3.5 Tessar	73.50
Super Ikonta IV, F3.5 Tessar	195.00
Contax IIa, F2 Sonnar	225.00
Contax IIIa, F1.5 Sonnar	

SAVE 62% OFF LIST PENTACON

with Import Certificate and guarantee cards and Automatic Lens

ORIGINAL LIST 259.50

BRAND NEW **99.50**

Case 14.95

BRAND NEW AT TREMENDOUS SAVINGS

35mm CAMERAS

Argus C-4, cc, ft (disc)	69.00
Aires III L F1.9, cc	79.95
Minolta A F3.5, cc	39.95
Minolta A2 F2.8	49.95
Minolta Super A F2	93.00
Minolta Auto Wide, F2.8	68.50
Miranda F1.9	118.00
Kodak Signet 30	41.00
Kodak Signet 50, ft	59.50
Exakta VX F2 Auto Biotar	198.00
Exa, F2.8	54.00
Ricoh 16 and Case	29.00
Ricoh 500, F2.8	49.75
Ricoh 519, F1.9	69.50
Vitessa L, F2	92.00
Praktica FX3, F2.8 Westanar	99.50

2¼sq. REFLEX CAMERAS

Ricoh Diacord L	44.95
Ricoh Diacord G	35.00
Kalimar 66	72.50
Kalloflex	89.00
Minolta Autocord	69.50
Minolta Autocord L	89.50

ELECTRONIC FLASH

Ultrablitz Jet	37.50
FR 140	21.95
FR Model II	36.95
Heiland 64A	39.95
Heiland 64B	43.50
	cc—case

EXPOSURE METERS REDUCED

Brockway S and case	21.95
Weston III and case	21.95
GE Golden Crown and case	24.50

8mm MOVIE CAMERAS

Brownie F2.3	22.50
Brownie F1.9	29.95
Brownie Turr. F2.3	44.00
Brownie Turr. F1.9	53.50
Keystone KA3 Turr. F1.9	144.50
Kodak Medallion Turr. F1.9	118.00
DeJur Elect. Turr. F1.9	112.00
Keystone K27, Turr. F1.9	68.50

8mm PROJECTORS

Bauer T10	127.50
DeJur Eldorado	79.00
DeJur 750	114.95
Kodak Brownie 300	46.95
Kodak Brownie 500	57.95
Keystone K60	47.00
Keystone K100	73.00
Keystone K105(A)	103.00
Keystone K109(D)	127.00

SLIDE PROJECTORS

Ansco 300 Dualet	27.95
Argus 300 Std	29.75
Argus 300 auto	44.00
Kodak 300	46.00
Kodak 300 auto	55.00
Kodak Cavalcade 500	110.00
Realist 400	16.50
Realist 400 auto	22.50
Viewlex Powermatic	83.50
Keystone K300	45.00
Keystone K510 (D)	78.00
TDC 7065 cc	46.50
TDC Duo 300	50.00
ft—flash	
Norwood Sup. Direc. & case	15.00
Weston DR	12.65
Sekonic L 36	8.50

ENLARGERS REDUCED

NEW Famous Make Enlargers at tremendous savings

New 35mm enlarger condenser type, with 50mm f4.5 lens

SPECIAL **18.95**

LIST 39.95

New 2¼ x 3¼ Enlarger with rack and pinion focusing, diffusion mode, 50mm lens

SPECIAL **24.50**

LIST 38.95

New 4 x 5 Enlarger with 135mm f4.5 lens

SPECIAL **69.95**

LIST 99.95

EXAKTA VX IIA CAMERA

complete with pentaprism rfdr. viewfinder and f2 auto Westanar lens (disc)

BRAND NEW SPEC. **209.00**

List 329.50

BRAND NEW SPEC. with F1.9 Auto Xenon lens (disc) **247.00**

List 399.50

complete with import certificate and guarantee cards. Waist Level Finder 12.50

SPECIAL PURCHASE VIEWLEX

Project-O-Matic Slide Projector

- built in auto projection
- 2 x 2 and Bantam slides
- 100 watt blower cooled
- Carrying case

LIST 79.50 BRAND NEW **42.95**

The above proj. complete with 40 x 40 tripod Screen, 12 extra trays in metal case.

LIST 109.40 BRAND NEW **59.50**

ULTRABLITZ COMET

- lifetime battery
- pocket size

LIST 54.94

BRAND NEW **33.75**

Ultrablitz Jet II

LIST 60.95 BRAND NEW **46.50**

Terrific Savings PRAKTICA FX 3 Complete OUTFIT

Praktica FX3 camera with

- F2.8 Auto Westanar lens
- 135mm F3.5 PRESET Telephoto
- Waist level finder
- Extension tube set
- Flashgun
- Leather carrying case
- LIST 259.00

BRAND NEW **134.50**

or with F2.8 Auto Tessar lens at 154.00

Outstanding Value PRAKTINA FX COMPLETE OUTFIT

Praktina FX Camera with

- F2.8 Auto Tessar lens
- PENTAPRISM RFDR viewfinder
- 135mm F3.5 Preset Telephoto
- Extension Tube Set
- Flashgun
- Leather carrying case
- LIST 352.00

BRAND NEW **219.95**

or with F2 Auto Biotar 245.00

WHERE CUSTOMERS BECOME FRIENDS

10% DOWN DELIVERS ON MINIFILMS' QUICK CONFIDENTIAL PAYMENT PLAN

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AWON PHOTOGRAPHIC DISCOUNTS !!!

SAVE MONEY—Unless otherwise specified, all film and paper is government surplus, outdated, respooled and repacked to bring you bargain prices.

FRESH KODACHROME

This 1959 dated film is in its original sealed package. Day, or Tung. Price includes processing plus mounting of 35mm. MINIMUM ORDER—3 ROLLS.

Size	Kodachrome
8mm x 25' dble. roll	$2.75
8mm x 25' dble. mag	3.60
16mm x 50' mag	5.35
16mm x 100' roll	7.85
35mm x 20 exp	2.55
35mm x 36 exp	3.90

Slide Tray SPECIAL

12 slide trays for Viewlex or TDC (hold 36 slides each) $5.95
12 Airequipt slide trays (hold 36 slides each) $16.95

Special Sale! CASES

for 12 Slide Trays

Dust-proof protection for your color slides. Holds up to 12 2x2" TDC Viewlex or Airequipt Trays. $4.95
CASE for 24 TRAYS $7.95

Black & White Movie Film Processing

8mm x 25' dble.	$ .55 ea.
16mm x 100'	1.00 ea.
16mm x 50'	.65 ea.

35mm KODACOLOR

35mm x 20 exp. — 3 for $4.50

Cardboard SLIDE MOUNTS

35mm — 100 for $1. — 1,000 for $8.50
127 & Super Slide—100 for $1.50 —1,000 for $10.
STEREO—100 for $3.50—1,000 for $25.
2¼x2¼—100 for $3.—1,000 for $27.

MOVIE FILM

Fast, fine grain B & W panchromatic ASA 50. Prices include new fast processing service.

8mm x 25' dble roll	$1.10
8mm x 100' Bolex dble	3.50
16mm x 50' mag	1.75
16mm x 50' mag Kod XX	2.25
16mm x 100' XX ASA 100	2.95
16mm x 100' Kodak Plus X	2.95
16mm x 50' roll, Plus X	1.65
16mm x 50' mag, X or XX	2.25

BUY SIX... GET ONE EXTRA FREE

Bulk Film Special

- BRAND NEW DAYLIGHT FILM LOADER
- 100' 35mm NEGATIVE FILM
- 5 FILM CARTRIDGES

All for only $5.95

ARGUS Sale!

BRAND NEW—DISCONTINUED

COMBINATION DISCOUNT! ARGUS C-3 w/case, flash & reg. lens PLUS SOLIGAR 135mm f4.5 tele lens. BOTH for only $64.95

	AWON PRICE
Argus C-3 w/case & fl. (disc)	$41.95
Argus C-4 w/case & fl.	66.95
Argus C-44 w/cs & fl.	79.95
SLIDE PROJECTORS	
Argus 300 BC	29.50
500 wt. aut chngr, case.	58.95

BARGAIN SPECIALS!

ENLARGING PAPER
9½x 200" SWSM ±1, 3 ..... $4.25
10 x 10" Varigam SWSM ..... (100 shts.) 2.95
CONTACT PAPER
10 x 10" SWSM ±4 ..... (250 shts.) $2.95

NEW EXPOSURE METERS

LIST		SPEC.
SALE	Alpex Direct Reading w/case	$ 5.95
	Sekonic Leader DeLux, Model 36, w/built-in booster cell and case	9.95
	Sekonic Leader DeLux, w/case	6.50
	Booster Cell for Sekonic Leader	2.95
	Compact, w/case	6.95
	FR Meter w/booster & cases	5.95
	GE Pr-1 w/case (discontinued)	18.95
	G.E. Mascot II	6.95
	Weston Meter III w/case	22.45
	GE Guardian w/case (disc.)	21.95
	Weston DR, Dir. Read	12.95

DARKROOM ACCESSORIES

BRAND NEW	List	Sale
Yankee Lordomat 20 Tank	DISCOUNT	$ 7.28
Yankee 4x5 Agitank cut film		6.95
Yankee Safe lite w/3 Filters		3.80
Airequipt Dialmaster Easel 11x17		12.89
Airequipt Jr. Printer 4x5		7.55
Brumberger 5x7 Adj. Printer		14.95
Brumberger 8x10 Paper Safe		8.80
Premier A1 Roto Dryer 12x29"		18.92
Staticmaster 1" Brush		3.50
Spot-O-Matic Enlarging Meter		10.50
Morse G3 35.8 16mm Dev. Tank		24.95
Pelouze Darkroom Scale		9.50
Nikor 35mm Tank single reel		6.72
Nikor 120-620 Tank w/reel		7.45
Nikor 33 Tank w/2 35mm reels		10.75

FRESH KODAK B&W FILM

Orig. Kodak Pack	Verichr or Plus X	Tri X or Pan X
127, 120 or 620	6 for $2.30	6 for $2.70
35mm x 20 exp.	6 for $3.90	6 for $4.20
35mm x 36 exp.	6 for $4.80	6 for $5.30

ANSCOCHROME 1959 ASA 32

35mm x 100' (orig. factory pack)	$30.00
35mm x 28' (orig. factory pack) w/loader	7.69
35mm x 20 exp. reloads $1.35 ea. 4 for	4.98
120 or 620 ..... 3 for	3.00
16mm x 100' (no proc.)	5.95
16mm x 100' (incl. proc.) $8.50 .. 3 for	24.00
16mm x 50' mag. (incl. proc.) $5.40 ..... 3 for	15.60

AWON Bulk Film Special!

35mm x 100' Du Pont ±4, exp index—day 325; tung 250	$ 3.50
35mm x 100' KODAK Plus X ASA 80	3.50
35mm x 100' Kodak TRI-X	3.50
35mm x 100' B&W ASA 24	.98
35mm x 100' Kodak Ortho Pos film	1.50
35mm x 100' Ansco ASA 50	3.50
16mm x 400' Positive Film	3.95
35mm x 100' Kodak Super XX	1.50
16mm x 400' Kod ASA 24 sngl or dbl perf	6.95
16mm x 400' Kodak XX (ASA 100) dbl perf	7.95

PAPER SALE

orig. boxes

CONTACT PAPER—less than 1¢ a print

4x5" SWGL (200 shts.)	$1.00
8x10 AZO DW Luster ±3 (100 shts.)	3.50
10x10 SWSM ±4 (250 shts.)	3.95
10x10" SWSM ±1, 4—1 box (100 sts.)	.98
18x22" LWSM ±1, 2—1 box (50 shts.)	1.98
14x17" LWSM ±1, 2, 3—1 box (50 shts.)	1.25
11x14" LWSM ±2, 3, 4—1 box (50 shts.)	.98
8x10½ LW Lustre ±0,1,2,5 (250 sheets)	1.98
7½x7½ SWGL ±4—1 box (250 shts.)	2.95
10x20" SWSM ±4, (50 sheets)	1.50
10x10" DWAMS ±1 (100 sheets)	1.95

**10x10" SWGL ±1, 2, 4 ... 100 shts 52.50
1,000 shts 22.50

ENLARGING PAPER

10x10" SWSM ±1, 3 (100 sheets)	$3.50
10x10" SWGL ±1 (100 shts.)	3.95
10x10" SWSM Varigam (250 shts.)	6.95
10x10" SWSM Varigam (100 shts.)	3.50
9½x200' SWSM ±1, 3	4.95
11x14" DWGL ±1 (50 sheets)	2.95
8x10½ Kodabromide SW Lustre ±1,4 (250 sheets)	7.00
11x14 SWSM ±2, 3, 4 (50 shts.)	3.50
11x14 DWGL ±1 (50 shts.)	3.95
20x24" SWSM ±3 (50 shts.)	6.95
4x5 SWGL ±1 ... 200 sheets	$1.98
... 1,000 sheets	$6.95
8x10" SWGL ±1—(100 sheets)	3.50
40"x10' DWSM ±4	2.00
9½"x1000' SWSM ±1, $8.95 ea.; 2 for	$16.95

MOVIE—QUANTITY DISCOUNTS

B&W ASA 50. SIZE	Reversal. 54 Rolls	27 Rolls	No Processing 15 Rolls
16mm x 50'	$19.95	$10.95	$ 5.95
*16mm x 100'	46.95	28.50	15.95

*Camera Spooled.

NEW—SUPER HIGH SPEED—1959 DATE

ANSCOCHROME ASA 100+

35mm x 20 exp.—list $2.35—SALE 3 for $5.75
120 roll—list $1.75—AWON SALE 3 for $4.10
35mm x 100' roll $37.95
16mm x 100' roll $6.95

New! Ansco Super Hypan B&W Sheet Film
2¼x3¼ (box of 25 sheets) ..... 3 for $6.
4x5 (box of 25 sheets) ..... 3 for $9.

WOLLENSAK Sale!

All BRAND NEW! All in factory sealed cartons! Superb equipment and values at bargain prices.

MOVIE CAMERAS

	List	AWON PRICE
8mm Model ±42, f1.9 F.F.	BIG DISCOUNTS	$ 50.75
8mm ±43, turret 3 lens f1.8		72.50
8mm ±58, f1.9 focusing		90.65
8mm ±53, 3 lens turret		105.95
8mm ±28 magazine, f1.9 foc.		104.65
8mm ±73 mag., 3 lens turret		174.80
16mm ±91 magazine, f1.9 foc		136.95
16mm ±93 mag, 3 lens turret		209.95

PROJECTORS

8mm ±715, 500 wt, 3 reels built-in splicer & case	118.65
8mm ±18, 750 wt, w/case	123.90
16mm ±65, 750 wt, w/case	145.00
2x2 Automatic SLIDE projector for 35mm and Super-slides, 500 wt; ±815	108.75

TAPE RECORDER

±1500, dual speed, w/case	137.95
±1515, dual speed Stereo	154.95

Brand New! Latest Model

FR ELECTRONIC FLASH

You save $24.55 off list
- Needs only 4 small batteries
- Hand-Grip head for "off-the-camera" shots
- Switches easily to AC power
- Gives consistent exposure
- Comes with camera bracket and AC line cord

AWON SPECIAL $29.95

ELECTRONIC FLASH OUTFITS

BRAND NEW	List	AWON PRICE
Ultrablitz Jet II, A.C. or Batt.	SALE	$44.95
Hershey "700" A.C. and Batt.		34.95
RI DYNALITE A.C.		17.95
FR Model II, A.C. or Batt.		32.95
FR Model 140, A.C.		21.95
Ricohlite A.C. & Batt		34.95
Heiland 64A A.C. or Batt.		36.95
Heiland 64B A.C. or Batt.		43.95

And your old flashgun in trade

ASA 50 Aero Ektachrome

35mm x 20 exp, $1.50 ea; 4 for $5; Process included.
35mm x 40' Bulk $3.95; 35mm x 75' Bulk $7.50
35mm x 75' Bulk plus 4½ gal. devel kit $8.95

YASHICA Cameras

Brand New—Latest Models—Price includes leather case

	AWON PRICE
YASHICA A	$23.00
YASHICA C, semi-automatic	35.95
YASHICA LM, semi-automatic with built-in exposure meter	44.95
YASHICAMAT-AUTOMATIC	57.95
YASHICA 44—127 film, 12 super slide exposures, 1 500 MM, AWON SPECIAL	45.50
YASHICA 635—Dual reflex—2¼ sq. & 35mm built-in, Semi-auto. 1 500, f3.5 AWON SPECIAL	46.95

NEW MOVIE CAMERAS

YASHICA 8mm ±85, f1.9	$32.99
YASHICA 8mm ±8T, f1.4	51.99
YASHICA 8mm ±8T2 with f1.4 normal and f1.4 Telephoto	82.95

AWON CHOPS KODAK PRICES

ALL BRAND NEW

KODAK CAMERAS	List	AWON PRICE
KODAK SIGNET 50 35mm, with flash	BIG DISCOUNTS	$ 59.95
KODAK RETINA IIIc 35mm, w/frame finder		112.95
KODAK STEREO outfit		74.60
KODAK STEREO camera		67.50
KODAK DUAFLEX IV outfit		18.95
BROWNIE HAWKEYE flash outfit		11.50
KODAK STARFLASH flash outfit		7.10
KODAK PONY 135 model C, f3.5		27.00
KODAK PONY 135 model IV outfit		41.95
KODAK SIGNET 40 35mm, w/flash		45.95
KODAK RETINA REFLEX 35mm, f2, w/case		139.95
KODAK MOVIE CAMERAS		
KODAK BROWNIE 8mm model II, f2.3		21.00
KODAK BROWNIE turret 8mm f1.9		59.95
BROWNIE 8mm turret, f2.3		41.95
KODAK MEDALLION 8mm mag. f1.9		79.95
KODAK MEDALLION 8mm mag. f1.9 foc		95.80
KODAK K100 16mm f1.9 lens		223.75
KODAK K100 turret 16mm f1.9 lens		251.75
KODAK PROJECTORS		
CINE KODAK Showtime 8mm proj		84.95
CINE KODAK Showtime w/variable speed control		96.95
BROWNIE "300" 8mm movie proj		46.95
BROWNIE "500" 8mm movie proj		57.95
KODASCOPE ROYAL 16mm movie proj		220.75
KODAK "300" 35mm slide projector w/readymatic changer		45.95
KODAK "300" w/Airequipt chngr		52.95
KODAK "500" w/Airequipt changer		62.00
KODAK Cavalcade Proj. ±500		109.95

Ask for the AWON DISCOUNT PRICES on all equipment

35mm BULK NEGATIVE SAFETY

Kodak Plus X, SUP. XX, Kodak Weston 24 Infra Red Ansco ASA 50 or DuPont ±1, 2, 3.
100'...$1.98 ea.; 400'... $7.50

35mm x 20 Exp. Cartridge Plus X, Tri-X, Infra Red, Microfile.
6 for $1.50; 12 for $2.50

CUT FILM SPECIALS

4x5 Kodak Infra Red (100 sh.)	1.00
8x10 E.K. Contr Proc Pan or Ansco Process (25 sh). 6 for	1.98 8.95
8x10 EK Infra Red (100 shts)	3.95
10x12 E.K. Com'l. (10 sh.)	1.98
11x14 Contr Proc Pan (10 sh.)	1.98

COLOR CUT FILM SPECIALS

4x5 Ektachrome B (10 sh.)	$2.50
5x7 Ektachrome (10 sh.)	2.95
8x10 Ansco Color (10 sh.) ea.	3.95
3 for	10.00

KODACHROME PROCESSING

35mm x 20 exp. mtg.	$1.00
35mm x 36 exp. mtg.	2.00
8mm x 25' dble.	1.00
8mm x 25' mag.	.65
16mm x 50' mag.	1.00
16mm x 100' roll	2.30

All film returned via insured mail. Check or Money Order must accompany film.

FLASHBULBS Sale!

Frankly, we're overstocked. We've slashed our prices to encourage you to buy a case or more and save.

±5 (Case of 120)	$ 8.95
M2 (Case of 120)	7.95
5M (Case of 120)	11.95
5B (Case of 120)	12.95
±6 (Case of 120)	12.50
6B (Case of 120)	14.95

EXCLUSIVE—RADIANT Portable Tripod Screens

With new VYNA-FLECT fabric. These screens are fireproof, fungus proof, and washable.

36 x 40	$ 8.95
40 x 40	9.95
37 x 50	13.95
50 x 50	14.95

50" Screens are shipped R.R. Expr. collect postage

Bulk ANSCO COLOR

Daylight or Tung. Outdated.

35mm x 100'	$11.95
35mm x 50'	6.50
35mm x 27½'	4.00

4-LITE Folding MOVIE BAR LIGHT

With metal carry case, 2 toggle switches & 7' heavy duty cord.

AWON SALE $7.50

Bulbs remain on bar in case $1 ea. with purch. of bar.

New, Compact Light Bar

4-Lite movie bar w/metal case AWON SALE—$10.82 w/4 bulbs without bulbs—$7.76

THIS MONTH'S SPECIALS

- 70mm x 100' Super XX $ 2.95
- 120 & 620 Kodacolor 3 for 3.00
- Telephoto Lens, 8mm, 11½", f3.5 4.95
- Wide angle lens, 7mm, f:3.2, F.F. 11.95
- Cardboard Stereo Mounts, 100 for 3.50; 1000 for 26.50
- Ansco 35mm Cardboard Mounts, 100 1.00; 1000 for 8.50
- Daylight Bulk Film Loader & 5 cartridges 4.95
- ANSCO 120 All Weather Pan 12 for 3.50
- KODACHROME 828 (proc. incl.) 3 for 3.00

SEND 25¢ for complete CATALOG listing all equipment at unbeatable prices!

Include 20% deposit on all C.O.D. orders. All equipment is NEW, all film & paper outdated and sold as is, all outdated film is respooled from bulk, unless otherwise stated.

ALL FOOTAGE APPROXIMATE

Export inquiries invited!

Postage & Insurance must be included with order. All prices subject to change without notice. Minimum order $5. Orders under $5, include 50¢ handling charge.

SPECIAL AWON COMBINATION DISCOUNT! ALL BRAND NEW!

AIRES III L

35mm camera with 6 element f1.9 lens.

plus CASE and B.C. FLASH GUN
plus Photoelectric EXPOSURE METER
plus Microlite 35mm VIEWER
plus Genuine Leather GADGET BAG

—all for only $89.95

AIRES III L Camera and case alone—limited supply. Order Now! $74.95

AWON FILMS

108-P W. 29 St.
N. Y. 1, N. Y.
LA 4-6376

GENTLEMEN: Please send me the items listed below. I enclose $ ..... including postage and insurance costs.

NAME

ADDRESS

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Shoot for home movies that look professional! Learn how in the world's first

HOME MOVIE MAKING Annual

(compiled by the Editors of POPULAR PHOTOGRAPHY)

On sale at newsstands and camera stores in October—

only $1.00

Now—for the first time—you can get a complete A-to-Z course in home movie making for only $1.00! Prepared by the Editors of POPULAR PHOTOGRAPHY, the brand new HOME MOVIE MAKING Annual offers you 150 pages of expert advice on shooting professional quality home movies.

You'll pick up valuable information such as:

100 IDEAS FOR HOME MOVIES—amateur motion picture opportunities that surround you at home, in the back yard, in your community.

HOW TO MAKE AN OLD TIME COMEDY — complete with scripts for hilarious routines —including a recipe for that old stand-by, the custard pie.

PRIMER ON COLOR—Learn how you can use color effectively — backgrounds, motion, subject arrangements.

PANNING: WHEN AND HOW — Find out how to make the best use of this tricky photographic technique.

HOW TO SPLICE, EDIT, ADD SOUND—Here's how to add the extras that make movies sparkle with excitement.

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INDEX OF ADVERTISERS

NOVEMBER 1958

ADVERTISER	PAGE NO.
Agfa Incorporated	8
Agof Schacht Lens Corp.	116
Airequipt Mfg. Co. Inc.	36
Air Photo Supply Corp.	133
Allied Impex Corporation	30, 31, 90, 91
American School of Photography	120
Ansco	2nd Cover
Art Center School, The	118
Asahi Optical Co. Ltd.	43
Astra Photo Products	132
Awons Films	135
Bell & Howell	105
Beseler Company, Charles	21
Bright Star	113
Brooks Institute of Photography	34
Burke & James	107
Burleigh Brooks, Inc.	32, 42
Bushnell, D. P., Inc.	110
Camera Import Corporation	97
Canon Camera Co., Inc.	40
Central Camera Co.	93
Color King Labs.	14
Columbian Enameling & Stamping Co.	101
Dimco-Gray Company	108
Dowlings Fifth Avenue	6, 7
Eastman Kodak Co.	4th Cover
Edixa Camera Company	98
Edmund Scientific Corp.	140, 141
Electronic Kits—Hi Fi Directory	100
Exakta Camera Company	29
F R Corporation, The	27
Freestyle Sales Co.	117
Fuji Photo Optical Products	17
Germain School of Photography	108
Graflex, Inc.	11
Grand Central Camera	41
Hamilton House	128
Hartford Fire Insurance Company Group	116
Heiland Division	16
Heitz, Karl	10
Hi Fi Directory—Electronic Kits	100
Home Movie Making Annual	136
Ideax Corporation	101
Imperial Enterprises, Inc.	120
Industrial Timer Corp.	48
Kalimar Inc.	12, 13
Keystone Camera Co., Inc.	50
Kinnard Co.	120
Kling Photo Corp.	38
Konica Camera Company	19
Leitz, Inc., E.	22, 23
Lincoln, Martin, Classified Information	110
Mamiya Division, Caprod Ltd.	113
Marshall Mfg. Co., Inc., John G.	96
Minifilm Camera Stores	134
Minolta Camera	20
National Camera Repair School	118
National Photo Labs.	120
Nega-File Company	98
New York Institute of Photography	39
Nikon, Inc.	33
Nuclear Products Co.	101
Olympus Optical Co.	95
Optics Mfg. Co.	92
Paillard Incorporated	46, 47
Panoram Film Labs, Inc.	137
Peerless Camera Stores	130, 131
Photography Annual	119
Polaroid Corp.	28
Popular Photography A B C Promotion	111
Popular Photography Subscriptions	118
Ray-Vogue Schools	118
Revere Camera Company	3
Riken Optical Industries, Ltd.	25
Ritz Camera Centers	37
Rochester Institute of Technology	110
Samoca Camera Co.	109
School of Modern Photography, The	45
Sekonic	24
Simmon Brothers	9
Solar Cine Products, Inc.	98
Standard Camera Corporation	35
Sterling-Howard	133
Supreme Photo Supply Corp.	127
Sylvania Electric Co.	5
Tiffen Marketing Corp.	100
Tokyo Optical Co., Ltd.	44
Unimark	99
University Camera Stores	126
Voss Photo Corporation	49
Wall St. Camera Exchange	124, 125
White Instr. Co., David	3rd Cover
Willoughby's	129
Zeiss, Inc., Carl	15, 89

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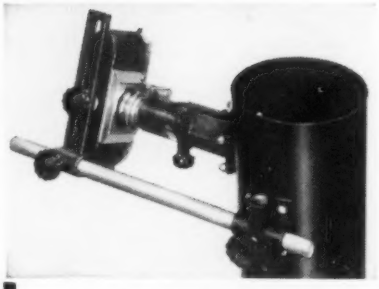

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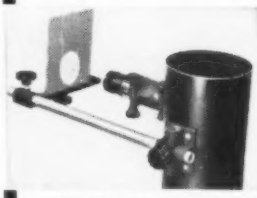

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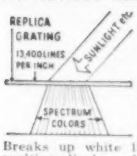

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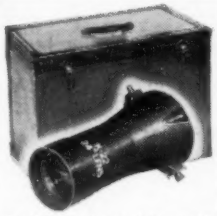

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ANSWER: The description sounds like these marks are caused by static electricity, generated when film is advanced swiftly in very dry weather. The remedy is to advance—and rewind—the film slowly, particularly when the humidity is low.

How can an amateur compete with pros at news events?

PATRICIA McHALE, INDIANAPOLIS, IND.—*If we amateurs are to make any money we must compete with the news photog. How can we, when at a parade they get in first and get the best positions? I have a free-lance press card but I've never used it because I didn't know whether I could or not.*

ANSWER: Why try to compete with the news photographer on his own grounds? The working press has a job to do at parades, ball games and such events. There are so many interested amateurs they would just get in the way of the pros and the public. You can compete, while news cameramen are busy covering the main event, by searching out human interest pictures they miss. An editor often needs shots of this sort to round out a series. If you can manage to put good ones on his desk often enough, maybe he will make you an accredited photographer. That free-lance press card probably isn't worth the paper it's printed on. Press credentials are of value only when issued by a publication or agency that is known and respected where you want to use them.

How can I be the foreground figure in my scenic shots?

J. PHILIP MEDBURY, DENVER, COLO.—*I like to take pictures in the mountains with friends in the foreground. If I go out alone, my scenic shots seem dead. How can I pose for my own pictures? My camera does not have a delayed-action shutter.*

ANSWER: There's a gadget made to order for this purpose. It's a self-timer that fits on the end of a cable release; some models screw directly into your camera's cable socket. To use it, set up your camera on a tripod to cover the scene you want to show. Carefully note the spot where you want to appear in it. Then cock the timer and take your place in the scene. It trips the shutter after giving you time to get into position. Another solution is an extra-long cable release, useful in places where you can conceal it easily. The pneumatic type of release can be extended simply by adding a length of rubber tubing.

Do between-lens shutters permit even film exposure?

KUNG-CHE H. CHEN, HONG KONG —*Discussing between-the-lens shutters, Mr. A says that the amount of light striking the center of the film is greater than at the margins because the shutter opens from the center to its extreme and closes again to the center, and is thus fully open for only part of the total exposure time. Mr. B says the same amount of light will reach the entire film surface. Who is right?*

ANSWER: Assuming that the shutter is properly placed, as all good ones are, Mr. B is correct. It should be at or very near the iris diaphragm. When it is, the fact that the shutter is partially opened or closed for a portion of the exposure time does not affect uniform film coverage any more than stopping down the diaphragm does.

At what opening does a lens give the sharpest pictures?

L. LARSEN, PORTLAND, ORE.—*A friend of mine swears his lens takes the sharpest pictures when it is set at f/6.3. I have always thought you should use the smallest aperture that a camera has, like f/22 or f/32, for maximum sharpness. Who is right?*

ANSWER: You both are right, but you aren't talking about exactly the same thing. When a camera is focused at a given distance, objects within a plane at that distance and at right angles to the lens axis will always be sharp, regardless of the aperture you use. As you select smaller apertures, things before that plane of focus and to the rear of it also will become satisfactorily sharp. This is the depth-of-field principle. It backs up what you have said. If you are interested only in objects within the plane upon which the camera is focused, then the problem is different. They will always be sharp, regardless of aperture, but the degree of sharpness will vary slightly at different lens settings. These differences are not great, but they result in every lens having one particular setting at which objects within the plane of principal focus are just a little bit sharper than they are at any other. This setting is called the critical aperture for that lens. It usually is a stop or two smaller than the maximum aperture, maybe more, depending on lens design. For your friend's lens it might well be f/6.3, just as he says. In most picture-taking situations depth of field and exposure requirements play a far more important part than critical aperture in determining which lens setting is best.

Every month POPULAR PHOTOGRAPHY receives close to 1,000 letters from readers. We'd like to reply to them all, but this would be an impossible task. Instead we'll answer the most interesting questions each month in this department.

What makes electronic flash pictures turn out so sharp?

A. L. MILLER, PITTSBURGH, PA.—*Last week I shot my first pictures with a speedlight outfit. They came out sharper than any I had ever taken before. What is there about electronic flash that brings out so much detail?*

ANSWER: This observation is fairly common among fans who use speedlight for the first time, particularly those who take all their pictures with camera hand-held. It isn't the quality of the illumination that makes the difference; it's the extremely short duration that does. Most units provide an effective exposure of 1/500 sec or less. That's a far cry from the 1/25 or 1/50 we are accustomed to using for ordinary flash pictures. The high speed eliminates the slight blur due to camera movement that many of us get (and accept without question) in hand-held shots taken at relatively slow shutter speeds. Result: sharper pictures!

What is the color quality of Aero Ektachrome film?

A. W. SANTWAY, ORLANDO, FLA. —*During the past few months I have noticed advertisements offering Aero Ektachrome film with an exposure index of from 32 to 100. Does this film have the usual Ektachrome qualities? Its speed would be helpful.*

ANSWER: Aero Ektachrome is tailor-made for aerial photography. Its contrast is considerably higher and its color qualities different from those desirable for amateur picture-taking. Kodak informs us that it is not factory supplied in 35-mm or other sizes suitable for popular hand cameras, and that processing requires a toxic chemical. Special precautions must be observed to avoid contact with the skin or inhaling the chemical in dry form. Kodak offers no processing service for Aero Ektachrome. All things considered, you probably would do better to stick with regular terrestrial films for shooting on the ground.

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Get complete fun from your interest in photography by *projecting* all your favorite color slides. At this unbelievably low price, almost any owner of a 127 or 35 mm. camera can now afford projection. "400" Automatic features REALGMATIC *semi-automatic* slide system, which is jam proof – lets you show up to 30 slides without changing trays. New 150-watt, Tru-Focus lamp gives amazingly brilliant image. Jet flow cooling system and heat-absorbing glass keep slides in focus. As a gift, a Realist "400" Automatic will be constantly used and appreciated.

Realomatic Projection Outfit Incorporates Realist "400" Automatic projector and 6 slide trays in one compact unit. Reinforced carrying case with brass fixtures. . . . **$44.95**

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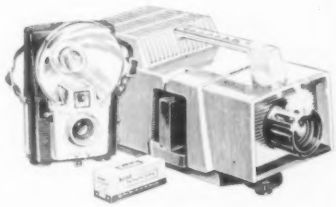
Everything needed to take and project color slides. Outfit consists of Realist "400" projector, Brownie Starflash camera and one roll of 127 Ektachrome color film. $32.50. Projector may be purchased separately. Shows 35 mm. or 127 square Super slides. Operates with simple push-pull of slide carrier. Projects big, bright, sharp. **$22.50**



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Shows 2¼ x 2¼ slides "big as life." Adaptable for showing 127 square Super slides, half a stereo pair and Polaroid. Blower cooled. Features 300-watt Tru-Focus lamp. . . . **$39.95**

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New Kodak Cavalcade Projector: you turn it on... it does the rest!

Changes slides by itself, gives brilliant big-as-life shows . . . automatically!

Now you can be a guest at your own slide shows!

With the Kodak Cavalcade Projector, you keep an eye only on the screen. You can come and go—and still the show goes on.

Choose brightness to suit the size of the screen picture—just by flicking a switch for 500-watt or 300-watt illumination.

Ask your dealer to demonstrate the new Cavalcade Projector. With sharp *f*/2.8 lens, remote-control cord, built-in screen pointer, $149.50 or as little as $15 down at many dealers.

All prices are list and subject to change without notice

Fully automatic timer shows slides at pre-set intervals: 4, 8, or 16 seconds. Split-second changing.

Remote-control changing, up to 12 feet. You control the show from anywhere in the room.

Pre-conditioning of all slides by temperature-controlled air, for more constant focus.

New slide guards—each slide is held in its own steel protector—for smooth, jam-free showings

New Kodak 300 Projector shows slides brilliantly, has Ready-matic Changer, $64.50. 500 Projector, $74.50.

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